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MBA PROFESSIONAL REPORT

Engineering Field Division/Activity Manpower Staffing

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June 2003

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The Naval Facilities Engineering Command (NAVFAC) is responsible for all U.S. Navy and Marine Corps facilities. The mission of NAVFAC is to plan and deliver innovative, best-value, technology-leveraged solutions and alternatives that enable the clients and various commands to accomplish their missions. NAVFAC is the major claimant for the eleven Engineering Field Divisions/Activities (EFD/A). The Officer in Charge of Contracts (OICC) is primarily responsible for the post-award phase of construction contracts that NAVFAC administers. The OICCs work at the various field offices throughout the NAVFAC organization.

The resource sponsor for NAVFAC is N4, Fleet Readiness and Logistics, who is responsible for identifying the mission, funding and authorizing requirements for NAVFAC. As the major claimant, NAVFAC is responsible for determining the requirements for the EFD/As, which are funded by N4. Due to funding constraints, the Navy is required to be as efficient as possible. This research analyzes the current manpower algorithm used to determine requirements for the various EFD/As. The data shows that the current algorithm does not reflect a number of factors impacting work-hours. An analysis was conducted to derive a more accurate algorithm to include the number of contracts and a method to include other missing factors such as distance, complexity, other military construction providers and commanding officer interest, etc. The conclusion of this research is that a more accurate algorithm that includes these missing factors is essential to the safe, efficient and thorough completion of workload accomplished by the EFD/A in support of NAVFAC's mission and ultimate responsibilities of N4.

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ENGINEERING FIELD DIVISION/ACTIVITY MANPOWER STAFFING

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ENGINEERING FIELD DIVISION/ACTIVITY MANPOWER STAFFING

ABSTRACT

The Naval Facilities Engineering Command (NAVFAC) is responsible for all U.S. Navy and Marine Corps facilities. The mission of NAVFAC is to plan and deliver innovative, best-value, technology-leveraged solutions and alternatives that enable the clients and various commands to accomplish their missions. NAVFAC is the major claimant for the eleven Engineering Field Divisions/Activities (EFD/A). The Officer in Charge of Contracts (OICC) is primarily responsible for the post-award phase of construction contracts that NAVFAC administers. The OICCs work at the various field offices throughout the NAVFAC organization.

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ACRONYMS AND ABBREVIATIONS

ACF	Area Cost Factor
AF	Adjustment Factor
AMD	Activity Manpower Document
AOR	Area Of Responsibility
AREICC	Assistant Resident Engineer In Charge of Contracts
AROICC	Assistant Resident Officers In Charge of Construction
BA	Billets Authorized
BAM	Baseline Assessment Memorandum
BOD	Beneficial Occupancy Date
BOQ	Bachelor Officer Quarters
BRAC	Base Realignment and Closure
CBA	Cost Benefit Analysis
CCD	Contract Completion Date
CEC	Civil Engineer Corps
CMFO	Commander, U.S. Pacific Fleet, Manpower Field Office
CNO	Chief of Naval Operations
CO	Commanding Officer
COMPACFLT	Commander, Pacific Fleet
CONREP	Construction Representative
CONUS	Continental United States
DROICC	Deputy Resident Officer In Charge of Construction
EFD/A/D	Engineering Field Activity/ Division

FAR	Federal Acquisition Regulations
FIP	Facilities Services In Place
FSC	Facilities Support Contracts
FTE	Full Time Equivalent
FY	Fiscal Year
GOCO	Government-Owned Contractor-Operated
GS	Government Series
KO	Contracting Officer
LANTDIV	Atlantic Division Engineering Command
MFT	Mission, Function and Task
MILCON	Military Construction
NAVFAC	Naval Facilities Engineering Command
NAVMAC	Navy Manpower Analysis Center
NFOR	NAVFAC Field Office Readiness
NMCP	Navy Military Civilian Personnel
NPV	Net Present Value
OA	Office Automation
OCONUS	Outside Continental United States
OICC	Officer In Charge of Contracts
O&MN	Operations and Maintenance Navy
OPNAV	Office of the Chief of Naval Operations
OPNAVINST	Office of the Chief of Naval Operations Instruction

PE	Professional Engineer
POE	Projected Operational Environment
POM	Program Objective Memorandum
PPBE	Planning, Programming, Budgeting and Execution
PPV	Public Private Venture
PR	Program Review
PWC/D	Public Works Center/Department
PWO	Public Works Officer
ROC	Required Operational Capability
ROICC	Resident Officer In Charge of Construction
SMR	Statement of Manpower Requirements
SMRD	Statement of Manpower Requirements Determination
TAD	Temporary Activity Duty
TFMMS	Total Force Manpower Management System
UIC	Unit Identification Code
WIP	Work In Place
XO	Executive Officer

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I. INTRODUCTION

The current algorithms used for determining manpower requirements at the Engineering Field Division/Activity (EFD/A) are the G-Construction and Y-Service formulas (Note, these formulas will hereafter be referred to as the G-Y algorithm). The Naval Facilities Engineering Command (NAVFAC) developed the G-Y algorithm approximately five years ago. The primary drivers of this algorithm are Work In Place (WIP) and Facilities services In Place (FIP) and were deemed appropriate at the time it was developed. WIP is the value in dollars of construction, repair, and maintenance work put in place during a specific period including material on-site and land acquisition as certified by the Resident Officer In Charge of Construction (ROICC) or the Officer In Charge of Contracts (OICC), excluding Facilities Support Contracts (FSC). FIP is essentially the same as WIP but is applicable to FSC contracts. However, changes resulting from the Base Realignment and Closure (BRAC) process have significantly changed the ROICC offices operating environment. In review of the impacts of BRAC, a study of the current manpower requirements algorithm was warranted.

ROICC offices have traditionally provided contract services for Naval bases and outlying government agencies in their Area of Responsibility (AOR). These contracting services consist of Military Construction (MILCON) projects involving large amounts of WIP and Operations and Maintenance Navy (O&MN) construction projects and service contracts that are typically lower in WIP.

When a base comes under BRAC or when a ROICC office located within an area of high Naval dispersion closes, the government agencies in the offices' AOR still require contracting services. The contract services left behind are imposed upon other nearby remaining ROICC offices. The remaining contracts generally are lower in WIP due to the lack of large MILCON funds. The lower WIP projects require outputs of manpower similar to their higher WIP counterparts in the post-award phase. The implication could mean that a field office would be required to handle several small dollar contracts and not

be authorized enough work-hours required to properly administer the contracts. The argument is that the current algorithm does not capture residual WIP once the dynamics of BRAC have occurred.

Several EFD/As have expressed concern over the validity of the current ROICC office manpower requirements. The purpose of this study was to validate the current algorithm. Through various methods of surveys and organizational analyses, it was determined that the current algorithm does not capture other factors affecting work-hours other than WIP and FIP. An analysis was conducted to derive a more accurate algorithm to include these missing factors such as distance, complexity, other military construction providers, commanding officer interest, number of contracts to be performed, etc. Due to time constraints and available data, the project focused on developing an algorithm to address only one of the factors, the number of contracts performed by an EFD/A. The study also addresses how complexity and distance traveled within the ROICC AOR could be incorporated into a new algorithm.

The study gathered data through surveys and analysis of historical NAVFAC data from Atlantic Division (LANTDIV) and EFA West. The data were used to analyze the current algorithm and recommend a method of deriving a more suitable algorithm for work-hours at the EFD/A levels to be distributed to the ROICC field offices. Studying manpower determination with the assistance from the Commander, U.S. Pacific Fleet, Manpower Field Office (CMFO) San Diego aided in the understanding of how manpower requirements are developed. The proposed method of deriving a more suitable algorithm for work-hours at the EFD/A level is expected to be applicable to all EFD/As affected by BRAC or containing an area of high Naval dispersion.

II. NAVAL FACILITIES ENGINEERING COMMAND ORGANIZATION

Naval Facilities Engineering Command (NAVFAC) manages the planning, design and construction of shore facilities for U.S. Navy activities around the world. It is a global organization with an annual volume of business in excess of $8 billion. As an integral member of the Navy and Marine Corps team, NAVFAC offers and delivers timely and effective facilities engineering solutions worldwide. Its 16,000 civilian and military personnel provide timely and efficient solutions for innovative, technology-leveraged strategies and alternatives in:

- Base Development, Planning, and Design
- Military Construction
- Public Works
- Utilities & Energy Services
- Base Realignment and Closure
- Environmental Programs
- Weight Handling
- Military Operations and Contingency Engineering
- Acquisition
- Real Estate
- Family & Bachelor Housing
- Ocean Engineering
- Transportation Planning & Management

NAVFAC headquarters is located at the Washington Navy Yard in Washington, D.C. It has 325 military and civilian personnel, which include engineers, architects, contract specialists and professionals, managing programs and projects and providing technical expertise and policy[1].

There are four Engineering Field Divisions (EFDs) and seven Engineering Field Activities (EFAs) located across the United States and Europe providing engineering support and services to the Naval shore establishments. An EFD is one of four sub-divisions of NAVFAC. An EFA is a component of an EFD. The criteria for these subdivisions are primarily based on geography and workload. The NAVFAC EFD/As global organization chart is shown in Figure 1[2].

1 [www.navfac.navy.mil], Accessed January 2003.

2 [www.navfac.navy.mil/pers4413/p1/usmap.cfm], Accessed June 2003.

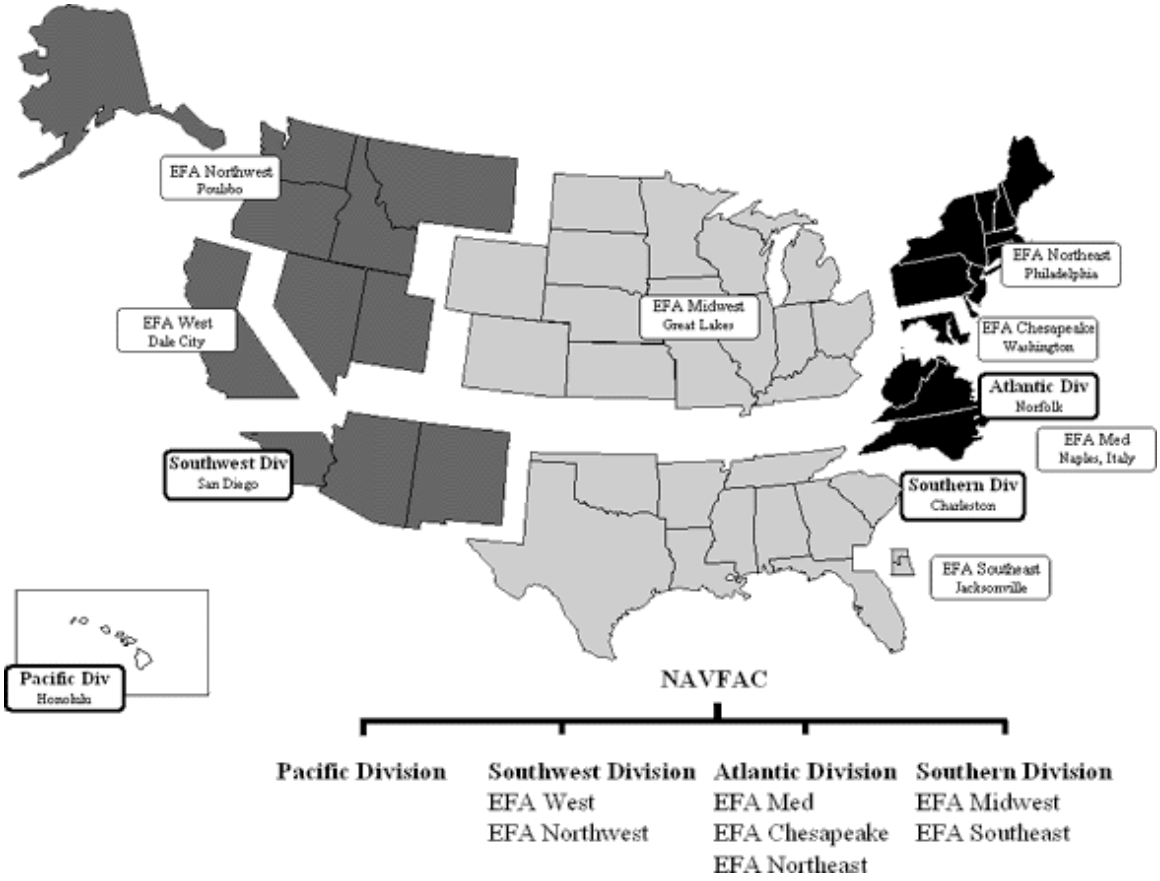

Figure 1. NAVFAC EFD/As Global Organization Chart.

The Resident Officer In Charge of Construction (ROICC) field office is a subcomponent of both the EFDs and the EFAs. The primary role of the EFD/As is to provide pre-award contractual support to the ROICC offices while the primary role of the ROICCs is to perform the post-award administration of contracts.

III. ROICC FIELD OFFICE FUNCTIONS

The Resident Officer In Charge of Construction (ROICC) contracting process consists of three phases, planning, formation and administration. During the planning stage, ROICC offices and the customer develop the requirements needed to carry out the project. In the formation stage, a contract is solicited and awarded to the winning contractor. The administrative portion consists of ensuring the requirements are carried out according to the plans and specifications of the contract[3]. Administration of the contract is the ROICC's primary focus. It includes but is not limited to the following functions:

- Modifications of the contract due to unforeseen conditions
- Modifications due to customer requested changes
- Settlement of contracting disputes
- Quality assurance
- Ensure safety standards are maintained
- Ensure Federal Acquisition Regulations (FAR) are followed
- Contract close-outs
- Request additional funds if required
- Ensure the contractor is paid per monthly invoices
- Ensure the project schedule is realistic and adhered to

Currently, the typical ROICC field office is headed by a mid-grade to senior Civil Engineer Corps (CEC) officer, designator 5100, who is either the Officer In Charge of Contracts (OICC) or the ROICC, depending on the size of the field office. A large field office is headed by a ROICC who is responsible for the administration of assigned contracts at a ROICC field office. A smaller field office is headed by an OICC who has responsibility for the overall management of a ROICC field office, including the execution and administration of construction, architect-engineer, engineering services,

3 Boudo, 1999.

and facilities support contracts[4]. The OICC is usually double-hatted as the Public Works Officer (PWO) of a Public Works Department/Center (PWD/C). Additional duties assigned to OICCs are listed (Appendix A).

If a field office is headed by an OICC, then the position of second in command is the Deputy Resident Officer In Charge of Construction (DROICC). The DROICC manages the day to day running of the ROICC office such as routine duties and administration much like an Executive Officer (XO) while the OICC determines new plans and policies much like a Commanding Officer (CO). Additional duties assigned to DROICCs are listed (Appendix A).

The civilian Resident Engineers serve in a supervisory role to assist the ROICCs/OICCs and are in charge of supervising the Project Managers and quality assurance personnel. They are also called Supervisory Engineers. Additional duties assigned to Resident Engineers are listed (Appendix A).

The Assistant Resident Officers In Charge of Construction (AROICCs) are junior CEC officers assigned by the ROICCs/OICCs for the administration of assigned contracts[5] for post-award functions. The AROICCs lead the three-member contract team to include the Contracting Officer (KO) and Construction Representative (CONREP). They are also called Project Managers. One of their primary duties is to ensure all contractors adhere to a previously agreed schedule. Additional duties assigned to AROICCs are listed (Appendix A).

The Assistant Resident Engineers In Charge of Construction (AREICCs) are designated by the ROICCs/OICCs for the technical oversight of assigned contracts.[6] The AREICCs serve essentially the same function as the AROICCs. The only differences are that they are civilians and tend to possess greater engineering proficiency through

4 P-68 NAVFAC Contracting Manual.

5 Ibid.

6 Ibid.

mandatory licensing with the state as Professional Engineers and have more experience. They are also called Project Managers or Project Engineers. Additional duties assigned to AREICCs are listed (Appendix A).

The Construction Representatives (CONREPs) perform the functional areas of quality assurance, inspection and acceptance of work. CONREPs monitor the contractor for quality, progress, labor, safety, and Buy America Act, etc. Their most important and time consuming duty is to maintain a physical presence on the job site observing construction to ensure the contract is executed with strict adherence to the plans and specifications as well as safety standards. They are also called Engineering Techs. Additional duties assigned to CONREPs are listed (Appendix A).

The civilian Supervisory Contracting Officers (KOs) assist the ROICCs/OICCs and are in charge of managing the other contracting officers and administrative support staff. They are also known as Supervisory Contract Specialists (Appendix A).

The KOs have overall responsibility for all contract processes and documents. Contracting Officers possess a warrant entitling them to obligate the government's money for contractual purposes. Because of their warrant, only KOs can award, administer and modify contracts. They are also known as 1102 Contract Specialists reflecting the numeral job code in human resources. A primary duty is correspondence with the contractor and documentation of all contracting actions along with assigned duties (Appendix A).

The Office Automation (OA) clerks are assistants who provide administrative support much like a secretary, but with many more responsibilities. They are also known as Procurement Techs or Procurement Clerks. Additional duties assigned to OAs are listed (Appendix A).

The ROICCs receive an allotment of work-hours from their respective EFD/As for the various positions cited above. If the ROICC offices feel they are not receiving enough work-hours from the EFD/As, they must then justify the need for additional work-hours from their respective EFD/As. This justification is done through the use of the Naval Facilities Engineering Command (NAVFAC) staffing readiness model.

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IV. DEVELOPMENT OF THE NAVFAC STAFFING READINESS MODELS

To determine appropriate staff levels at the individual Resident Officer In Charge of Construction (ROICC) offices, Naval Facilities Engineering Command (NAVFAC) has adopted a model that measures staffing readiness, which is included in the NAVFAC Field Office Readiness (NFOR) report. This report measures office readiness, by their ability to meet its mission requirements, in terms of staff levels, training and office equipment. The number of staff calculated from the staffing readiness model is compared to the actual staff level on board. This comparison assesses the quality of staff level readiness. If the model calculates a higher staff level than the actual number on board, then the office is under-manned. Similarly, if the model calculates a lower staff level than the actual number on board, then the office is over-manned. If the ROICCs determine they are under-manned, they adjust the staffing number through requests to the Engineering Field Divisions/Activities (EFD/As) for more personnel.

The NAVFAC staffing readiness model has been developed and modified over the span of several years. Modifications were necessary as the users realized the different iterations were not reliably expressing proper office staffing levels. This chapter follows the evolution of the staffing readiness model through its many iterations. It is important to note these staffing level models do not determine work-hours or staffing to be funded by NAVFAC. They are only used as benchmarks of what the individual EFD/A or ROICC field office should have in terms of manning based on projected WIP[7]. That is to say, the readiness models do not determine the work-hours at the EFD/A level, but are used to justify the work-hours assigned to the ROICC field offices by EFD/As.

7 Naval Facilities Engineering Command, Atlantic Division, ROICC Office Algorithm, PowerPoint Brief (Date Unknown).

A. INITIAL NAVFAC MODEL

One of the earliest NAVFAC staffing readiness models used the following equation:

$$B_T = 0.56(WIP/ACF) + 3x(\#\ Offices)$$

B_T = Total Billets for the EFD

WIP = Total Annual Work In Place for the EFD ($M)

ACF = Area Cost Factor

This model above determines total staffing levels across an EFD/A. The first part of the equation takes into consideration WIP and ACF. The second part, 3x(#offices), reflects the Navy contracting norm that a different individual performs each of the following three functions: 1) initiation of the requirement, 2) contract award, and 3) inspection and acceptance of services. In other words, when WIP equals zero, B_T is still three. In this model, WIP consists of Military Construction (MILCON) and Operation & Maintenance (O&MN) projects projected for the upcoming year.

The coefficient 0.56 was derived from historical data, trial and error, and a collaboration of several ROICCs from diverse offices performing a variety of construction projects. The ROICCs knew from past experience what staff levels effectively completed the ROICC mission. Therefore, they derived a coefficient that would enable the model to generate the same staff levels and be applicable to all EFD/As.

The Area Cost Factor (ACF) is used as a coefficient in the staffing model to differentiate the cost of construction around the world. For example, construction of a 200 room barracks in Iceland is much more expensive than the same facility in Gulfport, Mississippi. Similarly, it is much more expensive to construct the same facility in Pearl Harbor, Hawaii than in Norfolk, Virginia. The ACF is based on a bi-annual survey of local costs for 10 labor crafts, 20 construction materials and 4 equipment items. These labor, material and equipment items are typical of those used in the construction and

servicing of military facilities. This survey is distributed to 254 cities, most with Navy bases, scattered all around the world for an appropriate sampling. Some ACFs for FY2003 and FY2004 are shown in Table 1 for illustration.

Location	ACF Index
CALIFORNIA	
San Francisco	1.20
Lemoore Naval Air Station (N)	1.25
Monterey Area (N)	1.17
Travis Air Force Base (AF)	1.24
HAWAII	
Pearl Harbor (N)	1.57
MISSISSIPPI	
Gulfport Area (N)	0.92
VIRGINIA	
Norfolk	0.92
ICELAND	
Reykjavik	2.59

Table 1. Area Cost Factor Indices for FY2003 and FY2004.

At first glance at this equation, for expensive areas with a high ACF, one expects B_T would be lower which makes sense. For example, \$50M in WIP in Iceland will buy a lot less construction than \$50M in Mississippi because Iceland is so much more expensive, thereby reducing the number of staff needed for the same amount in WIP. However, upon closer observation, B_T stays approximately constant. This observation is logical because a typical construction job in a high ACF area will be more expensive thereby increasing the WIP. A higher ACF in the divisor is needed to compensate for the artificial rise in WIP. In other words, the high ACF balances out the rise in WIP due to expensive locale, allowing the WIP strictly due to increased construction to remain.

Two advantages of this equation are that it is adjusted for both the average area cost factor as well as inflation. Since projected WIP is in current year dollars and estimated every year, the equation inherently accounted for inflation. The same argument can be applied to the ACF. Inflation is inherently accounted for in the ACF because this factor, based on projected area construction costs, is updated every two years.

A disadvantage of this model is that it is advantageous to the EFD with the most field offices. For example, an EFD with 10 field offices, an ACF of 1 and WIP of $100M would require a staff of 86. An EFD with the same ACF and WIP, but only 5 field offices, would require a staff of 71. Clearly, there is a logic problem with the equation when the same amount of work generates different staffing levels.

B. LANTDIV, VERSION 1.0

To overcome the large EFD advantage, NAVFAC adopted the Atlantic Division (LANTDIV) staffing readiness model, version 1.0:

B_T = Adjusted WIP/1.7

B_T = Total Billets for the EFD

WIP = Total Annual Work In Place for the EFD ($M)

Like the earlier NAVFAC version, this model determines staffing levels across an EFD. Each EFD had developed its own staffing model. The LANTDIV model was chosen because it was the most developed. In this model, WIP consists of MILCON and O&MN projects projected for the upcoming year. Additionally, much like the earlier NAVFAC version, the LANTDIV version 1.0 of the model has the two advantages of being adjusted for both the average area cost factor as well as inflation inherently through WIP. A disadvantage of this model is that it does not differentiate between a large or small WIP generating field office. This equation only determines the total number of billets required for the EFD. There was no model established at this point in time to determine staffing levels for individual ROICC offices.

C. LANTDIV, VERSION 2.0

To determine individual ROICC office staffing levels, NAVFAC adopted the LANTDIV staffing readiness model, version 2.0:

$B_T = (W_X/1.3) + (W_Y/2.2) + (W_Z/4.0)$

B_T = Total ROICC Office Billets

W_X = WIP < $10M

W_Y = $10M < WIP < $70M

W_Z = WIP > $70M

This model has an advantage over version 1.0 due to its graduated annual WIP scale recognizing efficiencies for larger offices. For example, an office generating $9M in WIP requires seven personnel (9/1.3=6.92 ≈ 7). An office generating $18M in WIP requires only 11 personnel (10/1.3+8/2.2=11.32 ≈ 11), not the 14 one would expect with twice as much WIP. Similarly, an office generating $72M in WIP requires only 35 personnel (10/1.3+60/2.2+2/4=35.47 ≈35), not the 56 one would expect with eight times as much WIP. Theoretically, the more WIP the field office generates, the more efficient it becomes. This phenomenon is reflected in the huge jump in denominator between 2.2 and 4.0 versus a smaller jump between 1.3 and 2.2. Like the earlier NAVFAC versions, the LANTDIV version 2.0 of the model has the advantage of being adjusted for both the average area cost factor as well as inflation.

A disadvantage of this model is that it does not identify personnel by function. Once the EFD allocates the work-hours to the various field offices, the ROICCs determine the personnel to fulfill the work-hours assigned. There was no model established at this point in time to determine staffing levels for individual ROICC office functions such as Construction Representatives (CONREPs), Project Managers or Contracting Officers (KOs).

D. LANTDIV, VERSION 3.0

To determine individual ROICC office staffing readiness for each job function, NAVFAC, in December 1998, adopted the LANTDIV staffing readiness model, version 3.0:

Total annual work for the ROICC field office is calculated by:

$W_T = (W_C + W_R)/(ACF \times NAVFAC\ Cost\ Index)$

W_T = Total Annual Work for Office ($M)

W_C = Annual Office Construction WIP ($M)

W_R = Annual Office Lease-Construct WIP = $W_C/3$

For $W_T \leq$ $70M, total ROICC office billets, B_T, is:

$B_T = 3 + W_T/2.16$

Or in y = mx + b slope intercept form:

$B_T = 0.4630W_T + 3$

Staffing by ROICC office function is:

$K_p = 1 + W_T/17.5$ = # of 1102 Contracting Officers

$K_{am} = 0.5 + W_T/13$ = # of Military AROICCs

$K_{ac} = 0.5 + W_T/13$ = # of Civilian AREICCs

$T = W_T/21$ = # of Project Engineers

$Q = 1 + W_T/6.5$ = # of CONREPs

$A = W_T/20$ = # of Administrative Support Staff

Therefore, $B_T = K_p + K_{am} + K_{ac} + T + Q + A$

Just as in the earliest NAVFAC staffing model, the LANTDIV staffing model, version 3.0, for $W_T \leq$ $70M, reflects the Navy contracting norm that a different individual performs each of the following three functions: 1) initiation of the requirement, 2) contract award, and 3) inspection and acceptance of services. In other words, when W_T

equals zero, B_T is still three. These three positions are K_p, K_{am} & K_{ac}, and Q and are reflected in the "y-intercepts"[8] of the K_p, K_{am} and K_{ac}, and Q equations which are the minimum staffing for these job functions, all adding up to three. See Figure 2.

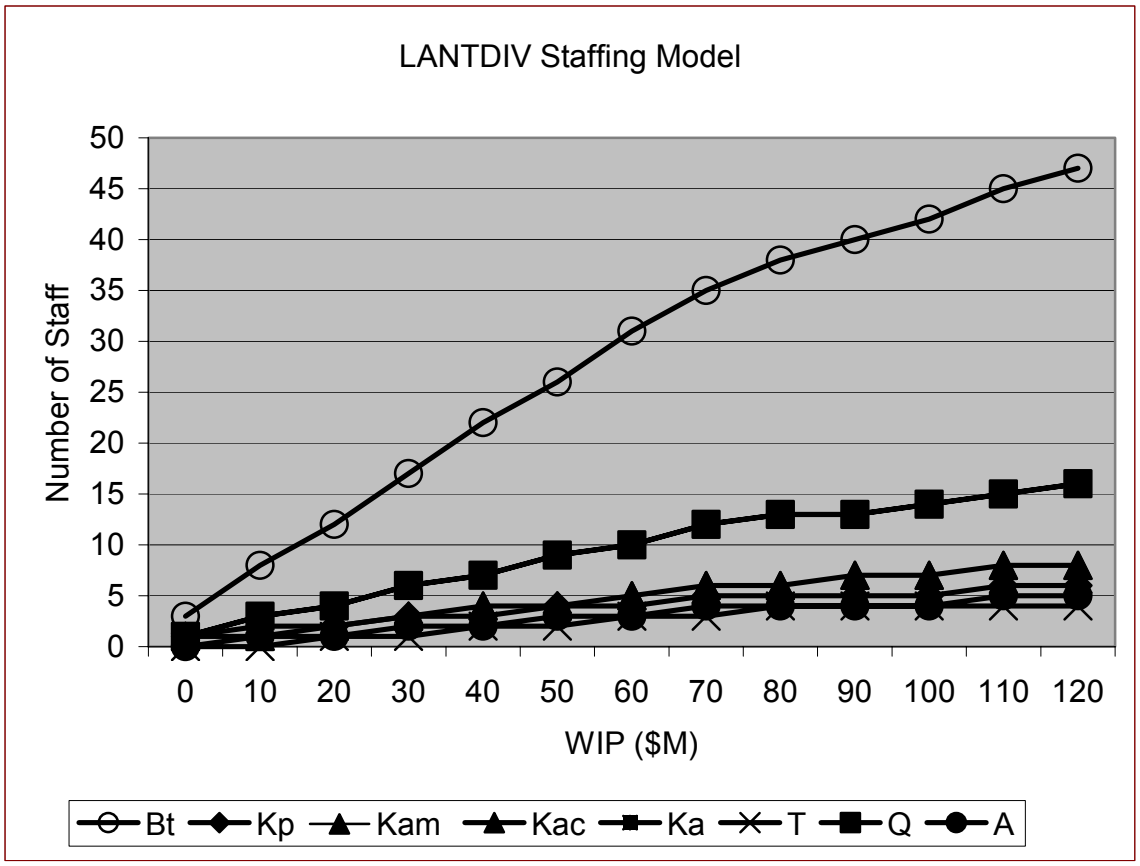

Figure 2. LANTDIV Staffing Model.

It is important to note that all the Assistant Resident Officers In Charge of Construction (AROICCs) are engineers, most of them licensed. So in a ROICC office with a smaller workload, $W_T \leq$ \$70M, the AROICCs serve the additional function of Project Engineers, hence a "y-intercept" of zero for T. Also, in a smaller workload office, the Contracting Officers (KOs) are assigned administrative support staff functions, hence a "y-intercept" of zero for A. It is important to note that the Q function, Construction Representative (CONREP), has the steepest slope. This is logical

8 The y-intercept in the slope intercept equation, y = mx + b, is b.

considering they must spend most of the day physically observing the jobsite and only being capable of observing one jobsite at a time which is time consuming. A small fraction of their workload is performed behind a desk. The others can perform the vast majority of their workload at their desk and easily switch from one project to another.

For W_T > \$70M, total ROICC office personnel, B_T, is:

$$B_T = 35.35 + (W_T - 70)/4.25$$

Or in y = mx + b slope intercept form:

$$B_T = 0.235W_T + 18.88$$

Staffing by ROICC office function is:

$K_p = 5.00 + (W_T - 70)/70$ = # of 1102 Contracting Officers

$K_{am} = 5.88 + (W_T - 70)/24$ = # of Military AROICCs

$K_{ac} = 5.88 + (W_T - 70)/24$ = # of Civilian AREICCs

$T = 3.33 + (W_T - 70)/44$ = # of Project Engineers

$Q = 11.77 + (W_T - 70)/12$ = # of CONREPs

$A = 3.50+ (W_T - 70)/40$ = # of Administrative Support staff

Again, $B_T = K_p + K_{am} + K_{ac} + T + Q + A$

In contrast to the smaller workload office, the larger workload ROICC office, W_T > \$70M, requires a minimum of 35 individuals. See Figure 2. In other words, when W_T = \$70M, then B_T = 35.35. This number is also reflected in the "y-intercepts" of all the staffing equations which are the minimum staffing levels for each job function, adding up to 35.35. It is also important to note that in a larger WIP office, there is too much work for the AROICCs to perform all the Project Engineer duties, hence a "y-intercept" of 3.33 for T. Another reason for a minimum of Project Engineer positions is because for offices with WIP more than \$70M, there are many more MILCON projects in the mix of contracts. These projects are Type I construction requiring mandatory Professional Engineer (PE) licensing, a minimum requirement for a Project Engineer. Even though

many AROICCs are licensed, some are not because licensing is not a requirement by NAVFAC. There is also too much work for KOs to perform the administrative support duties, hence a "y-intercept" of 3.50 for A. As in the case for a smaller workload office, the Q function for a larger workload office has the steepest slope displaying congruency with expectations. Also, like the earlier NAVFAC versions, the LANTDIV version 3.0 of the model for the full range of WIP consisting of MILCON and O&MN projects is adjusted for both the average area cost factor as well as inflation.

If one takes total annual work, W_T, from \$0 to \$120M, using an Area Cost Factor = 1 and a NAVFAC Cost Index = 1, staffing levels could be calculated, as shown in Table 2 and graphed in Figure 2.

Wt	Bt	Kp	Kam	Kac	Ka	T	Q	A
0	3	1	1	1	1	0	1	0
10	8	2	1	1	3	0	3	1
20	12	2	2	2	4	1	4	1
30	17	3	3	3	6	1	6	2
40	22	3	4	4	7	2	7	2
50	26	4	4	4	9	2	9	3
60	31	4	5	5	10	3	10	3
70	35	5	6	6	12	3	12	4
80	38	5	6	6	13	4	13	4
90	40	5	7	7	13	4	13	4
100	42	5	7	7	14	4	14	4
110	45	6	8	8	15	4	15	5
120	47	6	8	8	16	4	16	5

Table 2. LANTDIV Staffing Model.

From staffing levels in Table 2, it can be concluded that $K_a = K_{am} + K_{ac}$ and $K_{am} = K_{ac}$, therefore $K_a = 2K_{am} = 2K_{ac}$. Also, $K_a = Q$ and $T \approx A$. Additionally, as shown in Figure 2, the slope changes at \$70M. The change is due to economies of scale because less staff is required per million dollars of WIP above \$70M. The total ROICC office billets B_T line slope decreases from 0.463 to 0.235, showing that about half the staff is required per million dollars of WIP above \$70M.

Example: A ROICC office with an annual W_T = \$92M requires an office staff of 41 people as shown below:

$K_p = 5.00 + (92 - 70)/70 = 5.23$	5	# of Contracting Officers
$K_{am} = 5.88 + (92 - 70)/24 = 6.80$	7	# of Military AROICCs
$K_{ac} = 5.88 + (92 - 70)/24 = 6.80$	7	# of Civilian AREICCs
$T = 3.33 + (92 - 70)/44 = 3.83$	4	# of Project Engineers
$Q = 11.77 + (92 - 70)/12 = 13.60$	14	# of CONREPs
$A = 3.50 + (92 - 70)/40 = 4.05$	4	# of Admin Support
$B_T = 35.35 + (92 - 70)/4.25 = 40.53$	41	# of Total Staffing

E. "SCENARIO C"

In December of 1998, NAVFAC developed a construction and service readiness staffing model, called "Scenario C":

Construction staffing:

(K, T, Q & A)= Class I WIP/(2.4*AF) + Class II WIP/(1.5*AF)

Service staffing:

K = FIP/(1.5*AF)

Class I WIP = Construction WIP ($M) for contracts > $500K

Class II WIP = Construction WIP ($M) for contracts < $500K

FIP = Facilities services In Place

AF = Adjustment Factor = (ACF – 1)/2 + 1

In this model, the adjustment factor adjusts the ACF towards one. For example, if ACF = 0.97, then AF = 0.985. The advantage of using an AF versus the ACF is to promote fairness for all the EFD/As. When only an ACF was used, it had given one of the EFD/As an advantage over another. Converting the ACF to an AF dampened this advantage.

Like the previous models, the "Scenario C" also has the advantages of being adjusted for the average area cost factor and inflation. Additionally, WIP consists of MILCON and OM&N projects. This model also has the advantage of including WIP obtained from service contracts, via Facilities services In Place (FIP). FIP is the annual value of Facilities Service Contracts (FSC). It is similar to WIP, but instead of using construction values, it uses services values such as those for grass cutting and janitorial contracts. The inclusion of FIP is due to the more recent official consolidation of Public Works contracting services, primarily service oriented, with the ROICC contracting services, entirely construction oriented. In the past, the ROICC offices did not award or administer any service contracts, but in the late 1990s, they did it in order for NAVFAC to achieve pooled engineer-acquisition talent, economies of scale, and reduced delivery costs. Also, note the addition of the service contracts only increases the number of contracting officers and administrators for the ROICC offices. The engineers and CONREPs performing quality assurance for the service contracts still report to Public Works. Since effort is expended on additional service contract activities, the inclusion of FIP is necessary.

Another advantage of the "Scenario C" staffing model is the differentiation between Class I WIP and Class II WIP. Because Class I contracts are large dollar amount projects, one needs a higher constant in the divisor, 2.4, to balance out the increase in WIP due to many expensive contracts thereby decreasing personnel. Because Class II contracts are smaller dollar amount projects, one needs a lower constant in the divisor, 1.5, to balance out the WIP due to many cheaper contracts thereby increasing personnel requirements. The differentiation between Class I and II is needed because a contract, whether it is high dollar value or not, still needs the same number of personnel to administer it because the effort level is similar. If the constants in the devisors used in this model are eliminated, then an increase in WIP of $5M due to one added contract would require the same addition of personnel as those required for the same WIP level but spread out between 10 cheaper contracts. Since the effort level is similar from contract to contract, one can see that many more personnel are needed for the 10 cheaper contracts than those for the 1 expensive contract.

Similar logic is applied toward the smaller constant in the services staffing equation. The effort level for a services contract is similar to that of a Class II contract so the number of staffing required is similar, therefore the same constant was used in the divisor, 1.5.

One disadvantage of the "Scenario C" staffing model is the lack of differentiation between the numbers of staff in each position. For construction, the number of staff is derived for a pool of K, T, Q & A. The number of each is not determined from a formula as in the LANTDIV version 3.0 of the model. Another disadvantage is it does not allow for a minimum number of staff. Most of the previous model versions have a minimum of three staff built into the equation when WIP is approaching zero. Another disadvantage is economy of scale is not incorporated in this model. There is no differentiation of the number of personnel needed above or below the $70M point as in some of the previous model versions.

F. NFOR

To overcome the economy of scale problem, NAVFAC adopted the staffing readiness model developed for the NAVFAC Field Office Readiness (NFOR) report in April of 1999:

For $WIP_1 < \$70M$:

$$Staffing = WIP_1/(1.8*AF_C) + WIP_2/(1*AF_C) + FIP/(2*AF_S)$$

For $WIP_1 > \$70M$:

$$Staffing = 70/(1.8*AF_C) + (WIP_1-70)/(4*AF_C) + WIP_2/(1*AF_C) + FIP/(2*AF_S)$$

WIP_1 = Annual WIP ($M) on Type I contracts

WIP_2 = Annual WIP ($M) on Type II contracts

FIP = WIP ($M) on Facilities Services Contracts (FSC)

AF_C = Adjustment Factor, construction

= (ACF-1)/2 +1

AF_S = Adjustment Factor, facilities services

= (ACF-1)/3 +1

ACF = Area Cost Factor

The NFOR report version model has the advantage of differentiating between Type I and Type II construction. Type I construction involves sophisticated licensed engineering from a registered PE and design requiring plans and specifications. Typical Type I construction includes structural engineering, fire protection and high voltage electrical work. Type II construction involves limited technical design and can be performed by in-house PWD forces. Typical Type II construction includes less sophisticated maintenance work, incidental construction and cosmetic renovation. The differentiation between Type I and Type II is needed because the Type I contracts are typically expensive, high WIP projects and the Type II contracts are typically cheaper, low WIP projects. Therefore, as discussed repeatedly throughout this chapter, the low WIP projects require the same number of personnel as the high WIP contracts due to the similar amount of administrative effort. Hence, it makes sense that the artificially high WIP_1, due to an increase in expenses rather than an increase in the number of contracts, is balanced by a larger divisor than WIP_2 reducing the staffing number. It makes sense that staffing due to FIP is reduced by a very large divisor because FIP contracts tend to be low dollar value and only require one ROICC contracting officer versus the minimum of three personnel for construction. Another advantage of this model is that FIP is included in the total staffing equations. For simplicity, service staffing is not a separate equation as in the "Scenario C" model.

The NFOR report model also has the advantage of recognizing economies of scale. As discussed repeatedly throughout this chapter, fewer staff is required above an annual WIP of $70M. Like the previous models, this model has the advantages of being adjusted for the average area cost factor and inflation.

Like the "Scenario C" model, the NFOR report has the disadvantage of not differentiating between the numbers of staff in each position and does not reflect a minimum staffing number.

The readiness models cited above are used to justify the work-hours determined by NAVFAC for the EFD/As. However, they do not determine the work-hours for the

EFD/As. To do so, NAVFAC uses the G- Construction and Y-service algorithms. These algorithms are based on guidance for manpower determination as set forth in the Chief of Naval Operations Instruction (OPNAVINST) 1000.16J.

V. GUIDANCE FOR MANPOWER DETERMINATION

Shore based activity manpower requirements are determined differently from manpower requirements of deployable units with respect to i.e. peacetime vs. wartime. Each claimant[9] is responsible for the determination of shore based manpower requirements in their claimancy. The resource sponsor[10] is ultimately responsible for funding, validating and approving the shore manpower requirements on a peacetime workload basis for shore based activities. These requirements are then documented in the Statement of Manpower Requirements (SMR) and authorized in the Activity Manpower Document (AMD) by the claimant.

Shore activities are manned at peacetime requirement levels as opposed to deployable units that are manned at wartime requirement levels. The requirements for a shore activity are essentially equivalent to the Billets Authorized (BA) as reflected in the AMD. A "readiness gap" exists between requirements, authorizations, Navy Military and Civilian Personnel (NMCP) assigned and currently on board when all the requirements aren't funded or there is not enough inventory to distribute (Appendix B). Requirements or "spaces" are determined by an analysis of workload by the claimant, while authorizations are a function of the resource sponsor funding the requirements. The number of NMCP assigned to an activity represents the available inventory or "faces" that are expected to accomplish the identified workload in the requirement process. The currently on board represents personnel who are mustered at the activity on a daily basis. It is easy to understand that underestimated workload or under-funded requirements contribute to the readiness gap (Appendix B). Therefore, it is critical for Naval Facilities Engineering Command (NAVFAC), as the claimant, to capture and identify the correct work in the SMR for Engineering Field Divisions/Activities (EFD/As) and Resident Officer In Charge of Construction (ROICC) field offices. Total force manpower is accomplished once the claimant and resource sponsor determines, authorizes and

9 Claimants program authorizations (checks) for personnel.

10 Office of the Chief of Naval Operations (OPNAV) organization responsible for an identifiable aggregation of resources, which constitute inputs to warfare & supporting, tasks.

programs requirements in the form of BA via the Total Force Manpower Management System (TFMMS). The BA is reflected in the AMD by activity under a Unit Identification Code (UIC). The AMD represents the qualitative and quantitative expression of the manpower requirements and authorizations allocated to Naval units to perform their assigned Required Operational Capabilities (ROCs) in their Projected Operational Environment (POE) or shore activities to perform their assigned Missions, Functions and Tasks (MFT).

The MFT statement for shore-based activities is equivalent to the ROC and POE for deployable units. The mission is a set of concise, unclassified general statements that describe what the activity is to accomplish. The functions are the workloads derived from the main elements of the activity's mission. The tasks are workloads to be accomplished in conjunction with existing program policy directives or written tasking assignments[11]. The MFT is an instruction signed by the claimant verifying the activity's responsibilities.

The complete MFT for NAVFAC was not obtainable. However, the mission for NAVFAC is to plan and deliver innovative, best-value, technology-leveraged solutions and alternatives that enable the clients, various commands, to accomplish their missions[12].

Office of the Chief of Naval Operations Instruction (OPNAVINST) 1000.16J directs that manpower requirements be determined on a zero-based concept. This concept directs Navy Manpower Analysis Center (NAVMAC) and claimants to determine manpower on a multiyear basis without respect to funding, availability of personnel or structure of the organization. Manpower requirements are to reflect the actual and projected workload of an activity or unit. Manpower requirements are to be qualitized to the minimum quantity, grade and skill level necessary to satisfy performance of the assigned function[13].

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11 CDR W. D. Hatch II, NPS Monterey, MN 2111 Manpower, Personnel and Training Seminar I, Summer 2002, Slide #49.

12 [www.navfac.navy.mil], Accessed April 2003.

13 OPNAVINST 1000.16J.

The process for determining manpower requirements, as directed in OPNAVINST 1000.16J, is threefold:

- Determine the activity's approved mission function tasking, equipage and associated workload.
- Determine the minimum quantity of manpower required to support the activity's mission function tasking.
- Determine the mix of manpower needed (military, civilian, and contractor) to accomplish the mission function tasking and workload.

An integral part of manpower requirements determination is the establishment of standard workweeks for personnel utilization. The workweek for ashore units is based upon peacetime conditions. Chief of Naval Operations (CNO) uses them in the documentation of manpower requirements.

The Navy's standard workweeks are key elements in the calculation of manpower requirements. They are guidelines for sustained personnel utilization under projected wartime or peacetime conditions and are not intended to reflect the limits of personnel endurance. They are for planning purposes only and are neither restrictive nor binding on Commanders or Commanding Officers (COs) in establishing individual working hours[14].

The Navy standard workweek ashore is assumed to be 8 hours per day, 5 days per week totaling 40 hours per week. However, not all of these 40 hours are productive due to training, diversions, leave and holidays. Averaging techniques are used to determine the shore manpower productive workweek of 33.38 hours. Since averaging techniques are used, the total productive workweek may be greater or lesser than the 33.38 hours. Productive work is the time allocated to accomplish workload identified by activities' MFT. The 33.38 productive work-hours figure is determined by:

14 OPNAV INSTRUCTION 1000.16J (Appendix C-1).

Total hours-available weekly		40.00
Less Non-Available Time:		
Training	(0.32)	
Diversions	(0.20)	
Leave	(4.57)	
Holidays	(1.53)	(6.62)
Total hours available for productive work		33.38

Per OPNAVINST 1000.16J, the determination of manpower requirements in the case where requirements are derived through weekly work-hour measurements, calculations or validation, the following general equation is used:

Number of Billet Requirements = (Total Weekly Work-hours Required)/ (Applicable Productive work-hours per week)

where,

Total Weekly Work-hours Required = Total Justified Tasking Hours

Example: Assume a ROICC office uses 868 work-hours to complete all of the tasks required to fulfill their MFT statement. The 868 work-hours would then be divided by the productive work-hours per week to determine the number of billets required. In this case, 868/33.38 = 26 billets required for the ROICC office to complete its assigned MFT.

As noted in this example, if 40 hours were used in lieu of 33.38 hours then only 22 billets would be required, effectively understating the staffing requirement of the ROICC office. The 868 hours specified in the example represent the actual productive work-hours to accomplish all assigned tasks. Therefore, 6.62 hours accounts for the hours of training, diversions, leave and holidays that reduce the 40-hour standard workweek to a 33.38-hour productive workweek.

As indicated earlier, every shore activity is required to accomplish the activities specified in the MFT statement and agreed upon by their resource sponsor. Methodology designed to derive an algorithm to capture workload in the form of work-hours should take into account the activities' MFT statement. The next chapter will analyze the current NAVFAC algorithm.

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VI. ANALYSIS OF CURRENT ALGORITHM

The Naval Facilities Engineering Command (NAVFAC) work-hour algorithm used today at NAVFAC headquarters determines work-hours for the eleven Engineering Field Division/Activities (EFD/As). These work-hours, in the form of Billets Authorized (BA), are allocated to the individual Resident Officer In Charge of Construction (ROICC) field offices in their Area Of Responsibility (AOR). The individual ROICC office converts the BA to Full Time Equivalent (FTE) employees who work 40 hours per week.

Naval Facilities Engineering Command (NAVFAC) uses the G-Construction and Y-Services algorithm to determine the civilian work-hours allocated to each Engineering Field Division/Activity (EFD/A) as shown:

For G-Construction:

$$WH = \frac{(WIP*K_O)/[((ACF-1)/2)+1]}{1250} + PPV\ Units \times C_O$$

For Y-Services:

$$WH = (FIP*K_O)/(1250*AF)$$

WH = Work-hours

K_O = 1.0 CONUS (Continental US)

PPV = Public Private Venture (# of Units)

C_O = 3 hrs if > 600 units and 8 hrs if < 600 units

WIP = Annual Work In Place ($M Type I & II) for the EFD/A

FIP = Facilities services In Place ($M)

ACF = Area Cost Factor

AF = Adjustment Factor

The 1250 divisor used in both equations is derived from historical data. Although the historical data used to derive the algorithm was not available for review, advantages and disadvantages still can be assessed without it.

A. ADVANTAGES

One advantage of this algorithm, like the staffing readiness model, is that inflation is inherently accounted for through WIP, ACF and the AF. Inflation is accounted for through WIP because WIP is projected every year in current year dollars. Similarly, inflation is accounted for through the ACF and the AF because both these factors are updated every two years and reflect estimated construction costs for the area.

Simplicity is another advantage of this algorithm. Since the algorithm only uses five variables, WIP, FIP, ACF, AF and PPV[15] to determine total work-hours, it is simple and easy to use. Each office estimates their projected WIP and FIP for the up-coming five years. Then the work-hours calculated from the various field offices within each EFD/A, are summed together to determine the total work-hours for the EFD/A. Also adding to its simplicity is the fact there is only one dependent variable, work-hours, in each algorithm, as opposed to the readiness model, LANTDIV version 3.0, which determines the staffing level for each job function within the Resident Officer In Charge of Construction (ROICC) office.

Another advantage of this algorithm is the ability to apply it to overseas EFD/As due to the inclusion of the K_O coefficient. This coefficient is used because theoretically overseas offices, Outside Continental United States (OCONUS), are inefficient in comparison to CONUS offices due to language barriers, cultural differences and politics. In a CONUS office, K_O equals 1.0, whereas in OCONUS offices, K_O is greater than 1.0[16], which makes logical sense because the overseas inefficiencies tend to increase the work-hours required to perform the assigned workload.

15 PPV is the number of units associated with a Public Private Venture; only a few bases have PPVs.

16 Ko = 1.3 for EFA MED and 1.15 for PACDIV.

The G- Construction algorithm provides the PPV variable to account for Public Private Venture contracts, which are contracts between private developers and the Navy where both parties share the cost of construction. The Navy then leases these PPV facilities from the developers while the developers maintain the facilities. This practice is becoming more common with Navy housing contracts. The PPV portion of the formula demonstrates economies of scale through the use of the C_o coefficient. If the number of PPV units is greater than 600, then C_o equals 3 hours. Similarly, if the number of PPV units is less than 600, then C_o equals 8 hours. These work-hours represent the hours applied toward the leasing administration for the PPV.

This algorithm accounts for huge increases in WIP, which consistently occur with many Military Construction (MILCON) Projects, causing the work-hours to increase significantly. Therefore, during a period of Navy build-up, EFD/As will experience a significant surge in work-hours. This increase in work-hours translates into more billets for the EFD/As.

An advantage of the Y-Service portion of the algorithm to the EFD/A is the relationship between the FIP trend and the Facilities Service Contract (FSC) trend. This is due to the consolidation of service contracts performed, decreasing number of actual contracts let while the FIP values remain constant. Therefore, the work-hours remain stable as the number of contracts decreases as shown in Figures 3 and 4.

FIP ($M)					
EFA West	**FY98**	**FY99**	**FY00**	**FY01**	**FY02**
Lemoore	1.9	4.4	2.4	3.1	3.1
Travis	0.0	0.0	0.0	0.0	0.0
Monterey	1.8	9.1	6.0	5.2	5.2
Alameda (SF)	0.3	0.0	0.4	0.1	0.1
Total	4.0	13.5	8.8	8.4	8.4

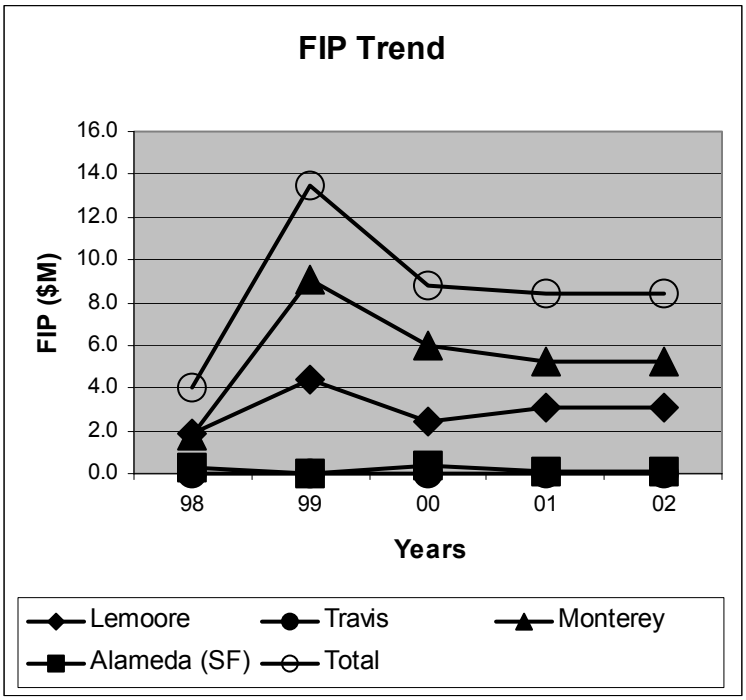

Figure 3. EFA West FIP Trend.

Number of FSC Contracts					
EFA West	**FY98**	**FY99**	**FY00**	**FY01**	**FY02**
Lemoore	96	76	25	1	0
Travis	0	0	0	0	0
Monterey	14	0	0	0	0
Alameda (SF)	17	6	3	1	1
Total	127	82	28	2	1

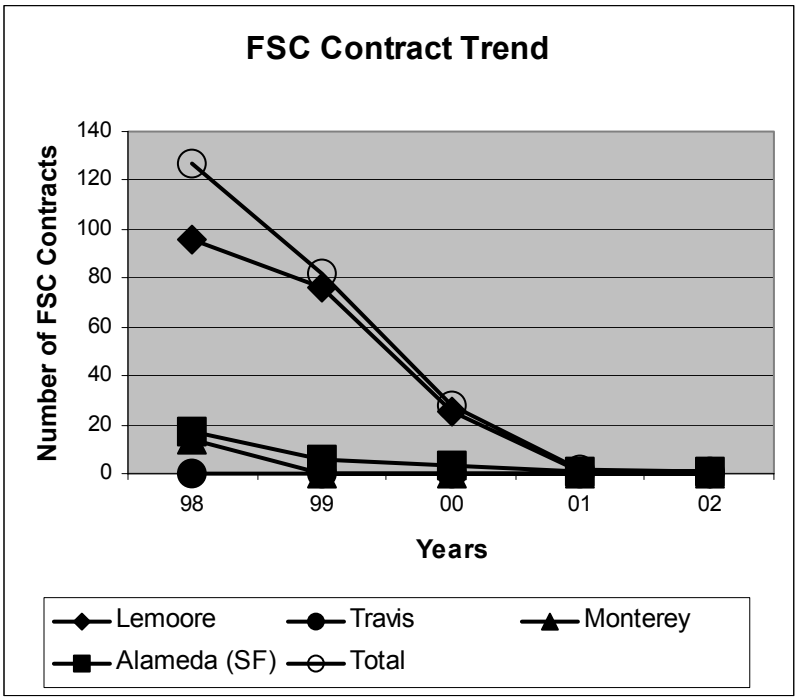

Figure 4. FSC Contract Trend.

B. DISADVANTAGES

One disadvantage is the sole use of WIP and FIP as the primary drivers of work-hours in the algorithm. For example, as WIP decreases and the number of contracts increases, the total work-hours decrease according to the NAVFAC algorithm. This occurrence is not necessarily desirable. Since there must be three full time equivalent (FTE) personnel assigned to each contract, a Project Manager, a Contracting Officer (KO) and a Construction Representative (CONREP), an increase in the number of contracts should theoretically increase the number of personnel needed to administer the contracts.

The historical data for EFA West indicate that WIP fluctuates approximately between $150 million and $200 million annually, while the quantity of contracts is increasing over time as shown in Figures 5 and 6.

WIP ($M) (Type I & II)					
EFA West	**FY98**	**FY99**	**FY00**	**FY01**	**FY02**
Lemoore	72.0	74.9	52.3	56.4	56.4
Travis	38.6	63.8	50.3	42.9	42.9
Monterey	15.6	14.3	20.7	13.9	13.9
Alameda (SF)	21.6	37.9	53.3	46.7	46.7
Total	147.8	190.9	176.6	159.9	159.9

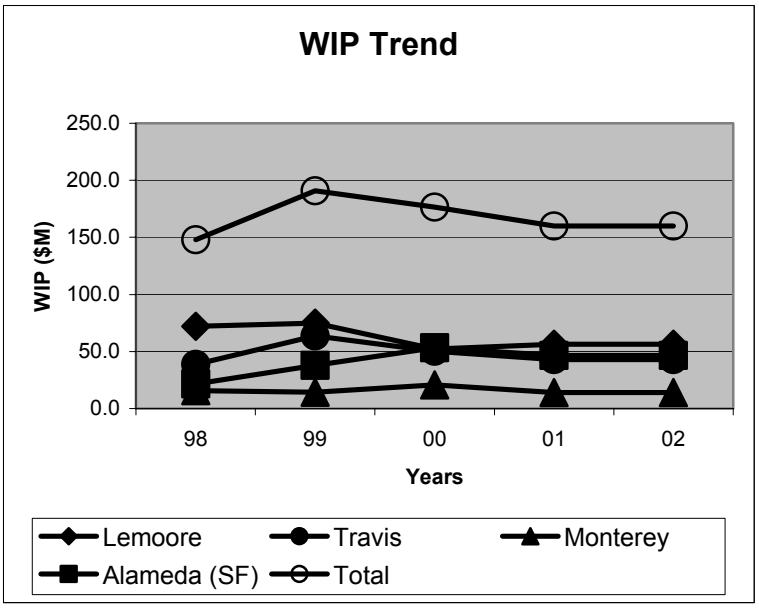

Figure 5. EFA West WIP Trend.

Number of Construction Contracts					
EFA West	**FY98**	**FY99**	**FY00**	**FY01**	**FY02**
Lemoore	110	141	179	233	274
Travis	24	32	44	40	17
Monterey	171	202	177	172	169
Alameda (SF)	47	77	79	94	94
Total	352	452	479	539	554

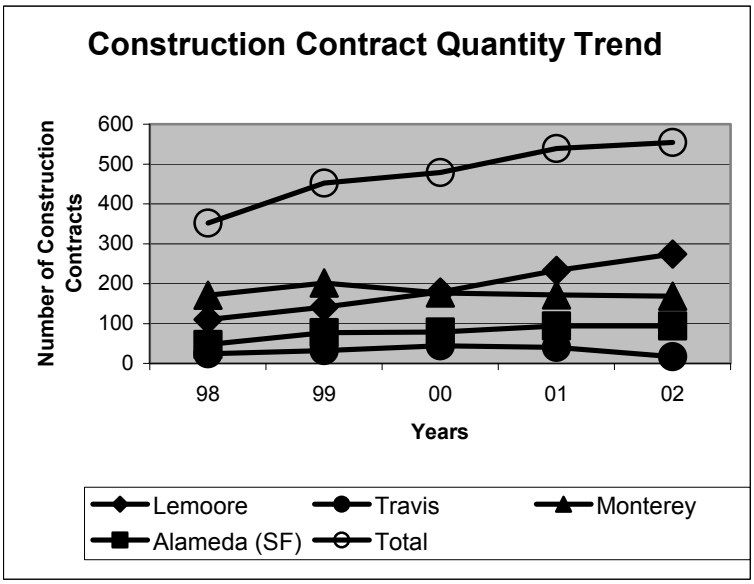

Figure 6. Construction Contract Quantity Trend.

The NAVFAC algorithm will maintain a constant level of civilian personnel in proportion to WIP, without consideration of the quantity of contracts being performed. If the growth in the number of contracts continues without a proportional WIP increase, the EFA will eventually be short of civilian personnel. If this trend is typical throughout all the EFD/As affected by Base Realignment and Closure (BRAC), the EFD/As will have to either reallocate civilian resources from their headquarters offices to the field offices or under man the work-hours of the field offices.

Another disadvantage of the current algorithm is that it does not differentiate between Type I and Type II WIP. Type I contracts are typically expensive, high WIP projects while Type II contracts are typically cheaper, low WIP projects. The low WIP projects require the same number of personnel as the high WIP contracts due to similar

administrative support requirements. Therefore, if the projects were imbalanced, more Type II than Type I projects, then fewer work-hours would be assigned to EFD/As with an increased workload.

Although simplicity is mentioned as an advantage, it might also be too simple and not account for all the work-hours required. The simplicity of the algorithm does not take into account economies of scale, which the readiness models do, such as the NAVFAC Field Office Readiness (NFOR) report model, which accounts for WIP levels greater than $70 million, thus realizing economies of scale.

Another disadvantage is that it is too simple in that it lacks complexity of the projects and distances of the projects from the ROICC office. The assumption is that the value of WIP increases with increased complexity. However, if the value of WIP does not reflect the increased complexity of the contract, then additional work-hours associated with the complexity of the contract are not accounted for in the algorithm.

A similar argument can be applied to distance. The algorithm does not account for the travel time associated with each contract. This travel time can be a factor when contracts are being performed far away from the field office. This is especially significant when a ROICC office is closed and another office further away is required to assume the responsibilities for the contracts still outstanding in the field office's Area Of Responsibility (AOR) that has been closed. Therefore, as distances increase, work-hours should also increase to reflect the travel time, which is actual workload.

Due to the disadvantages of the G-Y algorithm, the study proceeded to derive a new algorithm to include the number of contracts and a method to include several other variables.

VII. DERIVATION OF A NEW ALGORITHM

Several factors must be accounted for in the development of a new Naval Facilities Engineering Command (NAVFAC) algorithm used to determine Engineering Field Divisions/Activities (EFD/As) work-hours. The following steps and factors were followed and analyzed in calculating a new algorithm:

- The independent variables (factors) listed below are believed to impact work-hours and are seen as performance parameters for a new algorithm:
  - Duration of time spent traveling to and from contracting sites
  - Complexity of the projects
  - Work In Place (WIP) and Facilities Services In Place (FIP)
  - Number of construction and service contracts performed
  - How the current algorithm is determined
  - Area Cost Factors (ACF)
  - Civilians currently on board
  - Other military construction providers
  - Commanding Officer's (CO) interest
  - Quality of the contractors
  - Accuracy of the contracting documents
  - Significant changes to contractual working methods
  - Contract Completion Dates (CCD)
  - Beneficial Occupancy Dates (BOD)
  - Experience of staff personnel
- Determine if correlations exist between the dependent variable, work-hours, and each independent variable selected through either scatter plots or the Excel correlation function.
- Determine if the independent variables are significant in predicting the dependent variable, work-hours, through simple regression analysis.
- Determine if the independent variables, in combination with each other, are significant in predicting the dependent variable, work-hours, through multiple regression analysis.
- Run a multiple regression analyses to obtain a suitable regression model by changing the independent variables until one obtains a high R Square

value, a high F value, a low P-value for each independent variable, and a low P-value in the ANOVA table[17].

- Once a regression model is established, complete a Cost-Benefit Analysis (CBA) to determine if the regression model is more appropriate than the current model (algorithm).

The first step in deriving a new algorithm is to capture all the pertinent data. The following chapter will discuss what data was captured and its importance to the model.

17 An ANOVA table breaks down the total variation in the dependent variable into an explained portion (due to regression) and an unexplained portion (due to error).

VIII. DATA COLLECTED

The current data were provided by Engineering Field Activity (EFA) West, one of the seven EFAs most affected by Base Realignment and Closure (BRAC). Historical data were also provided by Naval Facilities Engineering Command (NAVFAC) to support the analysis of the current algorithm.

A survey to collect the following data to capture missing work-hours essential in deriving a new algorithm was assembled and sent to EFA West:

- Most current Mission, Function, and Task (MFT) statement at the EFA level and the four ROICC offices.
- Tasking survey for each individual at each the Residential Officer In Charge of Construction (ROICC) office:
  - Position description
  - Task performed for a Fiscal Year (FY)
  - Frequency of each task performed
  - Duration of each task performed
- List of construction contracts by title performed from FY1998 to FY2002 to include awarded amount and final dollar amount.
- List of any unique services performed (e.g. administering contracts at a GOCO facility) and associated work-hours.
- Personnel organization chart for the EFA and each field office.
- List of personnel by rank/rate or Government Series (GS) broken down by job function.
- Personnel status at time of survey (e.g. TAD, borrowed, temporary hire, part-time etc.).
- List of any contract support (i.e. any personnel hired via contract to carryout "typical" contracting duties).

At the field office level only:

- Complexity rating for each contract. On a scale of 1-5, (one being low, five the high) rate the complexity of the contracts listed. The personnel that should rate the complexity of the project should be the Assistant Resident Officers In Charge of Construction (AROICCs) and Construction Representatives (CONREPs). Therefore, at least two personnel should be assigning a subjective rating to each project/contract. Factors to consider

include how much time does one spend on a particular contract over another due to its increased complexity (consider technical issues, access to the contract site etc). The following is a guide:

  - Typical five: New construction of hush house, hospital
  - Typical three: New construction of Bachelor Officers Quarters (BOQ), Galley
  - Typical one: Demolition or runway improvements
  - Also consider operational burdens such as security/access difficulties

- For the contracts listed, indicate the distance each project is from the field office to the contract sites. Indicate the number of hours spent round trip traveling to the site for each person (e.g. AROICC, CONREP etc.) as if one travels to the contract site and back to the field office before traveling to their next destination.
- Number of work-hours for each office from FY1998 to FY2002.
- Number of overtime hours for the civilian and military personnel from FY1998 to FY2002.

EFA West summarized the surveys for ROICCs Lemoore, Monterey, Travis, San Francisco (Alameda), and two of its Headquarters; the 02 Operations branch and 05 Contracting branch, all located in California (Appendix C). These offices constitute EFA West's entire Area of Responsibility (AOR).

The mission portion of EFA West's MFT is identical to NAVFAC's mission statement and reads: "The mission of NAVFAC (EFA West) is to plan and deliver innovative, best-value, technology-leveraged solutions and alternatives that enable the clients to accomplish their mission[18]." Appendix D shows data returned from EFA West in terms of the functions of the MFT statement for EFA West and its ROICC offices. However, the task portion of EFA West's MFT were not available.

An objective of the survey was to determine how well EFA West and its ROICC offices' fulfilled their MFT statement. Additionally, information on the distance traveled, complexity of contracts and quantity of contracts each field office executes was gathered to analyze the impact to EFA work-hours.

18 [www.navfac.navy.mil], Accessed April 2003.

The total work-hours for each ROICC office is shown in Appendix E and a list of employees at EFA West is shown in Appendix F. A summary of calculated work-hours for the G-Y algorithm, civilians on board, Facilities services In Place (FIP), Work In Place (WIP), number of construction and service contracts, hours per tasking and total civilian work-hours is shown in Appendix G. Lessons learned from the Statement of Manpower Requirements Determination (SMRD) study at Strike Fighter Weapons School, NAS Lemoore with Commander, U.S. Pacific Fleet, Manpower Field Office San Diego is shown in Appendix H.

The Beneficial Occupancy Date (BOD) was also requested but was not readily identifiable for each contract. The BOD is the date at which the government assumes control of the facility and is allowed its occupation. These data would have to be extracted from each contract file by individual ROICC offices' historical archives. The BOD is critical in measuring performance effectiveness in a Cost-Benefit Analysis (CBA). A CBA would have to be performed to validate the adoption of a new algorithm. In a CBA, a comparison of benefit must be used to ascertain whether a new algorithm is valid.

Typically, there are two methods to determine work-hour requirements. One method is to perform a SMRD study. The other method is to use an algorithm (staffing standard) based on independent variables that relate to a dependent variable. Therefore, after the data were collected, an analysis was performed to determine the relationship between the independent and dependent variables so that an algorithm could be derived. The next chapter will discuss the SMRD and staffing standard process.

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IX. DATA ANALYSIS

A. STATEMENT OF MANPOWER REQUIREMENTS

The Commander, Pacific Fleet Manpower Field Office (CMFO) sends out Mission, Function and Task (MFT) surveys to activities that request manpower determination studies. Once CMFO receives the surveys back from the activities, they schedule an "on-site" visit to conduct personal workload interviews. The purpose of the "on-site" visit is to "iron out" individual task activities. It identifies tasks that are no longer valid and captures those tasks that are currently being performed but not identified in the activities' MFT. The "on-site" visit helps identify areas that can be completed more effectively and efficiently. It also captures an accurate accounting of how long it takes to accomplish specific tasks.

A staffing standard algorithm attempts to simplify the process of capturing work-hours. It does so by observing the correlation of multiple tasks (variables) in the form of an equation. The multiple variables reflect hours of work. Once all the appropriate multiple variables are assembled and some relationship is established (multivariable), the sum of the equation is work-hours (work-load).

Similar to COMPACFLT's Statement of Manpower Requirements Determination (SMRD) approach, the surveys sent to Engineering Field Activity (EFA) West requested each person at the field offices to list the tasks they completed on a daily, weekly, monthly or yearly basis. They were asked how often they completed those tasks and how much time it took. The purpose of the survey was to capture all the tasks required to complete the mission of the contracting field offices including those that were not being accomplished.

Some of the Resident Officers In Charge of Construction (ROICCs) had each person fill out the MFT survey, while others listed the type of personnel and the "typical" task they completed. Theoretically, and for the purpose of this study, all Assistant Resident Officers In Charge of Construction (AROICCs), Construction Representatives (CONREPs), and Contracting Officers (KOs) complete the same tasks from field office

to field office. The only difference should be the time to complete those tasks due to individuality and quantity of workload. The data shows a person in the same position in one field office did not list the same tasks as another person in the same position in another field office (Appendix C). This occurrence is completely understandable due to the significant number of tasks assigned each position. Additionally, an individuals' perception of what their position responsibilities are plays a role in the proper analysis.

The inconsistent data received suggests that a more detailed and less subjective survey should be conducted. An "on-site" visit, similar to COMPACFLT's, would clarify tasks being accomplished and better calculate the time associated with those tasks. Interviews conducted during the "on-site" visit would ensure the tasks support the MFT. If the tasks completed by the interviewed individuals are not in support of the MFT then the activity should not list them or have its MFT statement rewritten.

Upon determination of the total weekly work-hours (workload) associated with completing the valid tasks, the number of civilian personnel required can be calculated by dividing the weekly work-hours by the applicable productive workweek. The total productive hours are 33.38 per OPNAVINST 1000.16J for civilian personnel ashore, Continental United States (CONUS), and Outside Continental United States (OCONUS). The following formula determines the number of requirements:

Number of Requirements = (Total Weekly Work-hours Required)/(Applicable Productive Workweek)

where,

Total Weekly Work-hours Required = Total Valid Tasking Hours

The data collected from ROICC Travis list one ROICC, two AROICCs, four KOs, two Operational Assistants (OAs), four engineers, and five Engineering Techs for a total of 15 civilian personnel. Assuming the hours provided by ROICC Travis, excluding time for leave and training, are accurate and valid as per the MFT, the total productive weekly work-hours total 606. Therefore, the number of personnel that should be

assigned is: 606/33.38 = 18 requirements. Thus, the methodology shows eighteen valid requirements for the contracting office at ROICC Travis to accomplish the workload assigned by the MFT.

The method used in the ROICC Travis example should be applied to all the ROICC offices throughout EFA West and its Headquarters. The sum of the requirements justified by collected work-hours for EFA West's Headquarters and each of the ROICC offices in its Area of Responsibility (AOR) equates to EFA West's total manpower requirements.

The challenge is to relate the summed requirements and work-hours of the EFA to a formula whereby Naval Facilities Engineering Command (NAVFAC) can simply request a forecasted variable such as projected Work In Place (WIP) or the projected number of contracts and determine the work-hour requirements. Thereby not having to conduct an extensive shore manpower requirement determination study to develop the Statement of Manpower Requirement Document (SMRD) for each ROICC office throughout NAVFAC.

B. STATISTICAL ANALYSIS

The study realizes that many factors, such as travel to and from contracting sites that are relatively far from the ROICC office and the complexity of a contract, impact the time (work-hours) spent accomplishing each task. However, from an analytical standpoint, the study chose to focus on factors perceived as most significant in determining work-hours. These factors include the number of contracts actually being performed, civilians on-board, WIP, FIP and the G-Y algorithm work-hours.

1. Statistical Analysis of Actual Civilian Work-Hours

In absence of sufficient and accurate tasking-hours data, actual work-hours were used as a substitution. A simple regression analysis was performed to analyze the independent relationship between the actual work-hours and each independent (explanatory) variable, total number of construction & service contracts and WIP & FIP. The decision to lump WIP & FIP and the construction & service contracts together was

based on an initial simple regression analysis that determined that separating the variables were insignificant to the correlation. Table 3 shows the results of the work-hours vs. number of contracts.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.11825826
R Square	0.01398502
Adjusted R Square	-0.0407936
Standard Error	7459.57511
Observations	20

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	14206271.82	14206271.82	0.25530066	0.619497905
Residual	18	1001614695	55645260.82		
Total	19	1015820967			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	28659.9515	3229.512964	8.874388116	5.42665E-08	21874.99126	35444.91169
Number of Contracts	-10.682618	21.14227618	-0.505272857	0.619497905	-55.10092669	33.7356901

Table 3. Simple Regression Analysis for Actual Work-Hours vs. Number of Contracts.

Table 3 shows that the number of contracts by itself was not significant in determining the work-hours. Significance F and the P-value indicate the significance of the independent variable. If the F value is small, there is evidence that the regression equation provides little explanatory power. If the F value is large then the regression equation has high explanatory power[19].

If the Significance F and P-values are greater than 0.05, then the independent variable is not significant. The R Square value is the proportion of variation in the dependent variable explained by the variation in the independent variable. If the R

19 Albright, Winston, Zappe, Data Analysis & Decision Making with Microsoft Excel, Duxbury Press, 2202, p. 655.

Square value is greater than 0.75, then the percentage of variation in the dependent variable explained by the variation of the independent variable is greater than 75%. As in "industry standard", an R Square of .75 or greater is considered high and desirable[20].

Due to the large Significance F value and P-value, 0.620, the independent variable, number of contracts, is not significant to explain the work-hours. The very low R Square of 0.0140 indicates that only 1.4% of the variation in the number of work-hours is explained by the variation in the number of contracts. Because R Square is so low, this indicates that there are either other variables affecting work-hours, or the data are highly erroneous. The low F value of 0.255 indicates that the regression model, work-hours = 28659.952 - 10.683(number of contracts), provides little explanatory power. All these results point to other variables that may or may not include the variable, number of contracts, impacting work-hours.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.628151408
R Square	0.394574191
Adjusted R Square	0.360939424
Standard Error	5845.246077
Observations	20

ANOVA

	Df	*SS*	*MS*	*F*	*Significance F*
Regression	1	400816736	400816735.9	11.7311408	0.003019044
Residual	18	615004231	34166901.7		
Total	19	1015820967			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	16362.89207	3440.30055	4.756239127	0.00015778	9135.083234	23590.70091
WIP & FIP	248.2298548	72.4742766	3.425075304	0.00301904	95.96693202	400.4927776

Table 4. Simple Regression Analysis for Actual Work-Hours vs. WIP & FIP.

Table 4 shows the results of simple regression for the work-hours vs. WIP & FIP. Due to the small Significance F value and P-value, 0.000302, the independent variable,

20 Class Notes from GB3041 Analytical Tools for Managerial Decisions, Naval Postgraduate School, Monterey, California, Spring Quarter 2002.

WIP & FIP, is significant to explain the work-hours. The low R Square of 0.395 indicates that only 39% of the variation in the number of work-hours is explained by the variation in the WIP & FIP. Because R Square is low, this indicates that there are either other variables affecting work-hours, or the data are highly erroneous. The low F value of 11.731 indicates that the regression model, work-hours = 16362.892 + 248.230(WIP & FIP), provides moderate explanatory power at best. All these results point to other variables that may or may not include the variable, WIP & FIP, impacting work-hours.

	Civilian Work Hours	Number of Contracts	WIP & FIP
Civilian Work Hours	1		
Number of Contracts	-0.118258257	1	
WIP & FIP	0.628151408	0.126570093	1

Table 5. Correlation Table for Actual Work-Hours.

Table 5 shows the correlation between work-hours and the two independent variables, number of contracts and the WIP & FIP. The table indicates a weak negative correlation between the number of contracts and work-hours. It also indicates a moderate correlation between the WIP & FIP and the number of work-hours. These findings are consistent with the findings in the simple regression detailed above. The correlation between the WIP & FIP and number of contracts is small and positively correlated. This indicates that the increase in the number of contracts does not significantly increase the value of WIP & FIP.

2. Statistical Analysis of Actual Civilians On-Board

The civilians on-board variable was chosen because it represents management's allocation of manpower resources to the expected workload. A simple regression analysis was performed to analyze the independent relationship between the actual civilians on-board and each independent (explanatory) variable, work-hours calculated from the NAVFAC G-Y algorithm and WIP & FIP.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.7332945
R Square	0.5377208
Adjusted R Square	0.5120386
Standard Error	2.2731596
Observations	20

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*	
Regression	1	108.18942	108.18942	20.937506	0.000234424	
Residual	18	93.01058	5.1672545			
Total	19	201.2				
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	7.1176599	1.3418357	5.30442	4.827E-05	4.298565625	9.9367542
G -Y Work-Hours	0.0001816	3.97E-05	4.5757519	0.0002344	9.82401E-05	0.000265

Table 6. Simple Regression Analysis for Civilians On-Board vs. G-Y Work-Hours.

Table 6 shows the results of the civilians on-board vs. the work-hours from the NAVFAC G-Y algorithm. Due to the small Significance F value and P-value, 0.000234, the independent variable, G-Y work-hours, is significant to explain the civilians on-board. The moderate R Square of 0.538 indicates that 53.8% of the variation in the number of civilians on-board is explained by the variation in the G-Y work-hours. Because R Square is moderate, this still indicates that there are either other variables affecting civilians on-board, or the data are somewhat erroneous. The low F value of 20.938 indicates that the regression model, civilians on-board = 7.118 + 0.000181(G-Y Work-Hours), provides little explanatory power. All these results point to other variables that may or may not include the variable, G-Y Work-Hours, impacting civilians on-board.

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.7343765
R Square	0.5393088
Adjusted R Square	0.5137149
Standard Error	2.2692518
Observations	20

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	108.5089359	108.50894	21.071728	0.000226993
Residual	18	92.69106412	5.1495036		
Total	19	201.2			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*
Intercept	7.1287698	1.335599559	5.3375053	4.498E-05	4.322777037	9.9347625
WIP & FIP	0.1291558	0.028136092	4.5903951	0.000227	0.070043998	0.1882676

Table 7. Simple Regression Analysis for Civilians On-Board vs. WIP & FIP.

Table 7 shows the results of the civilians on-board vs. the WIP & FIP. Due to the small Significance F value and P-value, 0.000227, the independent variable, WIP & FIP, is significant to explain the civilians on-board. The moderate R Square of 0.514 indicates that 51.4% of the variation in the number of civilians on-board is explained by the variation in the WIP & FIP. Because R Square is moderate, this still indicates that there are either other variables affecting civilians on-board, or the data are somewhat erroneous. The low F value of 21.017 indicates that the regression model, civilians on-board = 7.129 + 0.129(WIP & FIP), provides little explanatory power. All these results point to other variables that may or may not include the variable, WIP & FIP, impacting civilians on-board.

	Civilians on Board	G -Y Work-Hours	WIP & FIP
Civilians on Board	1		
G -Y Work-Hours	0.733294466	1	
WIP & FIP	0.734376488	0.999986274	1

Table 8. Correlation Table for Civilians On-Board.

Table 8 shows the correlation between civilians on-board and the two independent variables, G-Y work-hours and the WIP & FIP. The table indicates a strong positive correlation between the civilians on-board and G-Y work-hours. It also indicates a strong positive correlation between the civilians on-board and the WIP & FIP. These findings are consistent with the findings in the simple regression detailed above. The correlation between the G-Y work-hours and WIP & FIP are highly positively correlated as expected because the G-Y algorithm is based on WIP & FIP.

3. Statistical Analysis of Actual Work-Hours through Multiple Regression

Multiple regression is used to study the relationship between several explanatory variables. It allows for study of the dependent variable through analyzing the independent variables and the effects that those independent variables have in the presence of each other. The following multiple regression analysis was performed to analyze the independent relationship between the actual work-hours and each independent (explanatory) variable, total number of construction & service contracts and WIP & FIP. Table 9 shows the results of the relationship.

Summary measures

Multiple R	0.6590
R Square	0.4343
Adj R Square	0.3678
StErr of Est	5813.9199

ANOVA Table

Source	df	SS	MS	F	P-value
Explained	2	441192678.5055	220596339.2528	6.5262	0.0079
Unexplained	17	574628288.0000	33801664.0000		

Regression coefficients

	Coefficient	Std Err	t-value	P-value	Lower limit	Upper limit
Constant	18296.2070	3852.0457	4.7497	0.0002	10169.0898	26423.3243
WIP & FIP	258.2825	72.6703	3.5542	0.0024	104.9613	411.6037
# of Contracts	-18.1554	16.6117	-1.0929	0.2897	-53.2030	16.8922

Table 9. Multiple Regression for Actual Civilian Hours vs. Total Number of Construction & Service Contracts and WIP & FIP.

Table 9 shows the results of the actual civilian work-hours vs. the total number of construction & service contracts and WIP & FIP. Due to the small P-value, 0.00790, indicated on the ANOVA table, the combination of the independent variables is significant to explain the actual civilian work-hours.

The small R Square of 0.434 indicates that 43.4% of the variation in the number of actual civilian work-hours is explained by the variation in the independent variables. Because R Square is low, this indicates that there are either other variables affecting actual civilian work-hours, or the data are somewhat erroneous.

The low F value of 6.526 indicates that the regression model, actual civilian work-hours = 18296.207 + 258.253(WIP & FIP) – 18.155(total number of contracts), provides little explanatory power. All these results point to other variables that may or may not include these variables impacting actual civilian work-hours.

The low P-value for WIP & FIP, 0.00240, makes this a significant variable, and therefore should be included in the regression model. The high P-value for total number of contracts, 0.290, makes this an insignificant variable, and therefore should be excluded from the regression model.

4. Statistical Analysis of Civilians On-Board through Multiple Regression

The following multiple regression analysis was performed to analyze the independent relationship between the civilians on-board and each independent (explanatory) variable, G-Y work-hours and WIP & FIP. Table 10 shows the results of the relationship.

Results of multiple regression for Civilian on Board

Summary measures

Multiple R	0.7621
R Square	0.5808
Adj R Square	0.5315
StErr of Est	2.2273

ANOVA Table

Source	df	SS	MS	F	P-value
Explained	2	116.8625	58.4312	11.7780	0.0006
Unexplained	17	84.3375	4.9610		

Regression coefficients

	Coefficient	Std Err	t-value	P-value	Lower limit	Upper limit
Constant	8.1611	1.5334	5.3221	0.0001	4.9258	11.3964
G&Y	-0.0096	0.0074	-1.2976	0.2117	-0.0252	0.0060
WIP & FIP	6.9535	5.2592	1.3222	0.2036	-4.1424	18.0495

Table 10. Multiple Regression for Civilians On-Board vs. G-Y Work-Hours and WIP & FIP.

Table 10 shows the results of the civilian on-board vs. G-Y work-hours and WIP & FIP. Due to the small P-value, 0.000600, indicated on the ANOVA table, the combination of the independent variables is significant to explain the civilians on-board.

The moderate R Square of 0.581 indicates that 58.1% of the variation in the number of civilians on-board is explained by the variation in the independent variables. Because R Square is moderate, this still indicates that there are either other variables affecting civilians on-board, or the data are somewhat erroneous.

The low F value of 11.778 indicates that the regression model, civilians on-board = 8.161 – 0.00960(G-Y work-hours) + 6.954(WIP & FIP), provides little explanatory power. All these results point to other variables that may or may not include these variables impacting civilians on-board.

The high P-value for WIP & FIP, 0.204, makes this an insignificant variable, and therefore should be excluded from the regression model. The high P-value for G-Y work-hours, 0.212, makes this an insignificant variable as well, and therefore should also be excluded from the regression model. This means that this model is not appropriate to predict the civilians on-board.

The analysis concludes that the use of actual work-hours as the dependent variable helps understand what is required to complete the assigned tasks. Whereas, the civilians on-board, dependent variable, leads to an understanding of how the management of EFA West assigns its personnel.

Additional multiple regression analysis is required to include independent variables that can affect the R Square, F and P-values in a desirable way. Once a regression model is determined, a Cost-Benefit Analysis (CBA) to determine if the regression model is more appropriate than the current model (algorithm) can be performed.

X. COST BENEFIT ANALYSIS

Evaluation of various manpower programs from an economic efficiency standpoint, generally referred to as Cost-Benefit Analysis (CBA), would indicate whether the value of the outputs of a project, program or theory exceeds the value of the inputs; and if so, by how much[21]. The CBA rationale aims to ensure the most optimal use of resources is accomplished.

A Cost-Benefit Analysis is only one of many ways by which a program's success can be judged. It does not give any final answers as to whether a program is "justified", or "good", or should be expanded or contracted. Once again, it merely suggests how well a program is operating[22].

A Cost- Benefit Analysis includes a systematic cataloguing of impacts as benefits (pros) and costs (cons), valuing in dollars (assigning weights), and then determining the net benefits of the proposal relative to the status quo[23].

The goal of the CBA is to consider all of the costs and benefits to society as a whole. A Cost-Benefit Analysis is a policy assessment method that quantifies in monetary terms the value of all policy consequences to all members of society[24].

It helps social decision-making[25]. The objective is to facilitate more efficient allocation of society's resources. Since demands for resources exceed supplies, the efficiency with which those resources are used is, or should be, an important consideration in the way they are allocated[26]. The CBA has the potential for increasing the efficiency of resources used.

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21 Ibid., p. 7.

22 Ibid., p 7.

23 Anthony E. Boardman et al., Cost-Benefit Analysis, Concept and Practice (2nd Edition), Prentice Hall, Inc., Upper Saddle River, New Jersey, 2001, pp. 1-2.

24 Ibid., p. 2.

25 Ibid., p. 2.

26 Steve L. Barsby, Cost-Benefit Analysis and Manpower Programs, D.C. Heath and Company Lexington Books, 1972, p. 7.

The process of conducting CBA can be broken down into nine basic steps[27]:

- Specify the set of alternative projects
- Decide whose benefits and costs count (standing)
- Catalogue the impacts and select measurement indicators (units)
- Predict the impacts quantitatively over the life of the project
- Monetize (attach dollar values to) all impacts
- Discount benefits and costs to obtain present values
- Compute the net present value (NPV) of each alternative
- Perform sensitivity analysis
- Make a recommendation based on the NPV and sensitivity analysis

Each step of the process has its own practical difficulties and limitations. A Cost-Benefit Analysis is especially vulnerable to misapplication through carelessness, naiveté, outright deception or errors[28] (omission errors, forecasting errors, measurement errors, and valuation errors).

The G-Y algorithm and the algorithms derived from the regression models were the alternatives considered and compared in this CBA.

The beneficiaries of the CBA, those who have standing, are the Department of the Navy, all Engineering Field Divisions/Activities (EFD/As), Resident Office In Charge of Construction (ROICC) office personnel, clients and contractors.

The main impacts under consideration were the Work In Place (WIP) value (average and total), number of contracts and timeliness of contracts (Contract Completion Date (CCD) and Beneficiary Occupancy Date (BOD).

The primary objectives of this study were to analyze the current NAVFAC G-Y algorithm and to recommend a method to derive a new algorithm to include other independent variables. An important part of this study would have been to measure the effectiveness of the algorithm by performing a thorough CBA. The lack of access to data

27 Anthony E. Boardman et al., Cost-Benefit Analysis, Concept and Practice (2nd Edition), Prentice Hall, Inc., Upper Saddle River, New Jersey, 2001, p. 7.

27 Ibid., p. 5.

28 Ibid., p. 5.

limited the definitive measure of effectiveness, the BOD, and impacted the ability to conduct the CBA. As a result, an analysis comparing the current algorithm to alternative algorithms in order to determine the marginal benefit per unit of cost to make an informed decision was not possible.

In a CBA, impacts of the alternatives need to be considered. Additionally, the process to effectively implement a new algorithm needs to be considered. The next chapter will discuss the required organizational change if a new manpower requirement algorithm is adopted by NAVFAC and EFD/As.

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XI. ORGANIZATIONAL CHANGE WITHIN THE EFD/A

The implementation of any new algorithm is not an easy task. The process of implementing a new algorithm among 11 Engineering Field Divisions/Activities (EFD/As) would take some time but the initial analysis of the data shows the existing algorithm is marginal at best in capturing workload and ultimate in providing a foundation for manpower requirements. The change process would have to be congruent with each EFD/A's Mission, Function and Task (MFT) statement. The vast majority of standard operating procedures used by EFD/As is highly customized to the missions of these organizations and would not differ in the case of Naval Facilities Engineering Command (NAVFAC).

Defining organizational change is an important step in better understanding what the new algorithm would bring to facilities that are affected by Base Realignment and Closure (BRAC) and still relying on the local Resident Officer In Charge of Construction (ROICC) office for contractual commitments.

What is organizational change? Typically, the concept of organizational change is in regard to larger organization-wide changes, as opposed to smaller changes such as adding a new person, modifying a program, etc. Examples of larger organization-wide changes might include a change in mission, restructuring operations (e.g., restructuring to self-managed teams, layoffs, etc.), new technologies, mergers, major collaborations, "rightsizing", new programs such as Total Quality Management, re-engineering, and in NAVFAC's case, a complete new algorithm that would more accurately support the manpower requirements for EFD/As affected by BRAC. "Often the term designating a fundamental and radical reorientation in the way the organization operates is referred to as organizational transformation[29]."

Successful change involves top management, including the board and chief executive. In reference to this study, the algorithmic data used to support the claims

29 McNamara, MBA, Ph.D., "Broad Overview of Various Programs and Movements to Improve Organizational Performance".

would need full endorsement from the Chief of Naval Facilities Engineering Command. As the primary change agent, the Chief of NAVFAC would be responsible for ensuring the algorithmic claims and vision be translated to a realistic plan and carried out.

Change is usually best carried out as a team-wide effort. Communication about the change should be frequent and with all EFD/A facilities. The new algorithm would assist BRAC'd ROICC offices to better sustain change, the structures of the ROICC offices would be modified, including strategic plans, policies and procedures. This change in the structures of NAVFAC and the subsequent EFD/A facilities would involve an unfreezing change and re-freezing process.

With any change comes a certain level of resistance. The best approach to address resistance is through increased and sustained communications and education[30]. For example, NAVFAC should meet with all EFD/A Facilities and staff to explain reasons for the change, how it generally will be carried out and where they can go for additional information. A plan should be developed and communicated. Forums are a good way for staff to express their ideas for the plan to include concerns and any frustrations, if any.

There are numerous methods of how an algorithm could be implemented throughout the EFD/A facilities. McNamara gives examples such as the use of a Balanced Scorecard, Benchmarking, Business Process Reengineering, Continuous improvement and Strategic Management as means of any new algorithm implementation. A balanced scorecard analysis could be used to closely examine how each method would aid in the implementation of a new algorithm. The balanced scorecard focuses on four indicators, including customer perspective, internal-business processes which would be a more efficient way of manning/staffing ROICC office facilities, learning and growth which would encompass the steady increase of manning knowledge based on the new algorithm, and financials which would be reflected in the Planning, Programming,

30 Ibid.

Budgeting and Execution (PPBE) Process funding structure as funds would be appropriated more efficiently. The balance scorecard could also be used to monitor progress toward NAVFAC's strategic goals.

Benchmarking uses standard measurements in a service or industry for comparison to other organizations in order to gain perspective on organizational performance. For example, a new algorithm derived could be based on standard benchmarks used by organizations outside of NAVFAC for manning and staffing contract facilities. The results from benchmark comparisons can be used in more overall processes and is often perceived as a quality initiative.

Business process reengineering aims to increase performance by radically re-designing the organization's structures and processes, including starting over from the ground up. Business process reengineering parallels the purpose of a new algorithm to be a complete starting over with a new algorithm used for manning and staffing in order to increase ROICC office performance.

Continuous improvement focuses on improving customer satisfaction through continuous and incremental improvements to processes such as innovatively brainstorming new ideas to more efficiently produce results and maintain customer satisfaction.

Similarly to McNamara, John P. Kotter, author of Leading Change, designed his eight steps[31] to help transform any organization, which can be applied to EFD/As affected by BRAC. The purpose of these steps is to provide a framework that NAVFAC and the EFD/As can use as they transform their organization to a more efficient one by implementing the recommended method.

A. KOTTER'S EIGHT STEPS

- Establishing a sense of urgency - examining market and competitive realities and identifying and discussing crises, potential crises or major opportunities

31 John Kotter's 1995 Article, Harvard Business Review on Change, "Leading Change: Why Transformation Efforts Fail", p. 7.

- Forming a powerful guiding coalition - assembling a group with enough power to lead the change effort and encouraging the group to work together as a team. With support of the Chief of NAVFAC and EFD/A leadership a powerful coalition could be formed making implementation of a new algorithm, the transformation process and buy-in from those who remain skeptical, more likely.
- Creating a vision - creating a vision to help direct the change effort and developing strategies for achieving that vision.
- Communicating the vision - using every vehicle possible to communicate the new vision and strategies and teaching new behaviors by the example of the guiding coalition. Those who fully support the new algorithm would have to advertise and lobby for manning/staffing forums and conferences so that the proper use of the new algorithm would be disseminated throughout the EFA facilities.
- Empowering others to act on the vision - getting rid of obstacles to change, changing the systems or structures that seriously undermine the vision, and encouraging risk-taking and nontraditional ideas, activities and actions. Reward those innovative ideas that assist with the achievement of the over-all vision and mission task statement.
- Planning for and creating short-term wins. Planning for visible performance improvements. Creating these improvements. Recognizing and rewarding employees involved in the improvements.
- Consolidating improvements and producing still more change - using increased credibility to change systems, structures and policies that don't fit the vision, hiring, promoting and developing employees who can implement the vision, reinvigorating the process with new projects, themes and change agents. Continuous use of change agents and constant review of the current ways of doing business can create improvements.
- Institutionalizing new approaches - articulating the connections between the new behaviors and corporate success and developing the means to ensure leadership development and succession. Again, leadership symposiums and forums, which educate leaders on how to use a new algorithm coupled with innovation are means to achieving the mission function task statement.

The use of a new algorithm coupled with some of the techniques for organizational transformation listed above will enable NAVFAC and its EFD/As to more effectively meet their respective MFT statements.

XII. SUMMARY, FINDINGS AND RECOMMENDATIONS

SUMMARY

As stated in the OPNAVINST 1000.16J, manpower requirements shall be based on directed Mission, Function and Tasks (MFTs) for shore commands. The workload shall be determined using industrial engineering or other justifiable techniques, which yield accurate manpower requirements[32].

The guidance for manpower determination shall be zero-based. The zero-based concept means that manpower is determined on a multiyear basis without respect to funds, availability of personnel or current organizational structure. The bottom line of OPNAVINST 1000.16J is that a shore command is required to determine the minimum quality and quantity of manpower to support its MFT statement.

One method used to determine manpower requirements is to perform a Shore Manpower Requirements Determination (SMRD) study, which is extensive, expensive and time consuming. The goal of this study was to first account for all the time spent performing tasks that support the MFT on a weekly basis and then use the appropriate hours of the productive workweek as the divisor to determine the total number of personnel required.

Another method to justify manpower requirements is to develop an algorithm (staffing algorithm) that accounts for tasking performed to fulfill the MFT that could be applied to similar activities. The Naval Facilities Engineering Command (NAVFAC) currently uses such a staffing standard for its Engineering Field Divisions/Activities (EFD/As).

A. FINDINGS

When a review of the number of contracts administered over time at EFA West showed an increase and the Work In Place (WIP) values associated with those contracts showed a decrease, it was thought perhaps the current algorithm was not appropriate. The thought was that as workload increased as a function of the number of contracts

32 OPNAVINST 1000.16J.

increasing, the work-hours calculated by the algorithm did not compensate for the additional workload of the contracts. This conclusion was logical because the algorithm used WIP as a driver and not the number of contracts.

Actual work-hours were used as the dependent variable in lieu of the hours performed to complete the tasks for the MFT. The reason for this decision was the lack of sufficient and accurate tasking hours (workload) and the reasonably close correlation between the number of hours to fulfill the MFT (total tasking hours) to the actual work-hours performed by the field offices.

Data on several independent variables were gathered to find a relationship between them and the actual work-hours performed. The independent variable, number of contracts, was analyzed first due to the observation discussed earlier with EFA West's increasing load of contracts but stable WIP level.

After performing a simple regression analysis with respect to actual work-hours and the number of contracts performed, the results indicated the number of contracts was weakly and negativity correlated to the actual work-hours and not significant in explaining the variation in work-hours. The variation in number of contracts by itself only explained 1.4% of the variation in the number of work-hours.

After performing a simple regression analysis with respect to the actual work-hours and the combined WIP and Facilities services In Place (FIP), it was determined the WIP & FIP combination was significant and that its variation explained 39% of the variation in work-hours. The correlation between WIP & FIP and work-hours was much greater than the correlation between the number of contracts and work-hours. Also, the correlation between WIP & FIP and work-hours is moderate at 0.6821.

A multiple regression analysis was performed to determine if the combined independent variables, WIP & FIP and the number of contracts performed, better explained the work-hours than the two independent variables separately. The data showed the combination of the independent variables is significant to explain the actual work-hours. However, only 43% of the variation in the work-hours is explained by the variation in the two independent variables. The addition of the independent variable,

number of contracts, to WIP & FIP only increased the explainable variation by 4%. The data clearly indicate that adding the variable, number of contracts, does not significantly explain the variation in the work-hours taken with only WIP & FIP. It appears that some other independent variables, in addition to WIP & FIP and the number of contracts, are driving the work-hours.

After performing a simple regression analysis with respect to the civilians on-board and the G-Y work-hours and with respect to civilians on-board and WIP & FIP, it was determined that the independent variables, G-Y work-hours and WIP & FIP, were separately significant and that variation in these variables explained approximately 54% of the variation in the dependent variable, civilians on-board. The correlations between the independent variables to the dependent variable were almost the same, 0.73. This result is not surprising since the number of civilians on board is determined by the G-Y algorithm work-hours, which is based on WIP & FIP. However, these correlations will never be 100% due to the EFD/As' headquarters reserving a portion of the total work-hours provided from NAVFAC for themselves.

A multiple regression analysis was performed to determine if the combined independent variables, G-Y work-hours and WIP & FIP, better explained the dependent variable, civilians on-board, than the two independent variables separately. The data, through the low P-value of the ANOVA table, showed the combination of the two independent variables are significant to explain the number of civilians on-board. Even though the high P-values for the independent variables indicate G-Y work-hours and WIP & FIP are insignificant and should be excluded from the regression model, this conclusion is misleading for two reasons. One, the simple regression analyses for these two variables separately indicate they are significant and should be included in the regression model for civilians on board. Two, multicollinearity is present between G-Y work-hours and WIP & FIP as seen in Table 8 that indicates a 0.999986 correlation, almost perfect. Multicollinearity is the presence of a fairly strong linear relationship between two or more independent variables, and it can make multiple regression analysis difficult. Therefore, due to reasons one and two, G-Y work-hours and WIP & FIP are significant and should be included in the regression model to determine civilians on-

board, but should not be included together because of the multicollinearity. This nearly perfect correlation is not surprising since WIP & FIP drive the determination of G-Y work-hours.

B. RECOMMENDATIONS

Further studies to include other variables such as complexity of the contracts, distances to the constructions sites, field offices' methods of doing business, etc. should be included in a multiple regression analysis to explain more of the variation in work-hours. Only once all the independent variables that have a high correlation with the dependent variable, work-hours, are ascertained as being significant and that variations in them explain a large portion of the variation in work-hours, can an accurate equation (algorithm) be developed to predict field office work-hours.

This analysis concludes that in lieu of a SMRD, the current algorithm used at NAVFAC is only useful in explaining 39% of the variation of work-hours at the field offices of EFA West. It does not draw any conclusions regarding the variation of work-hours at the EFA West headquarters level. Additional analysis of independent variables is required to derive a more accurate field office regression model to explain the variation of the work-hours.

Although the current algorithm does not include the number of contracts performed and is primarily based on WIP & FIP, the analysis concludes that including the independent variable, the number of contracts performed, does not significantly explain the variation of work-hours. However, the number of contracts performed may or may not be significant when combined with other independent variables. Further study is needed to ascertain its significance.

The research concludes that further examination of the independent variables, which are highly correlated to work-hours to derive a regression model (algorithm) that accurately predicts the actual Resident Officer In Charge of Construction (ROICC) field office work-hours, is warranted. In addition, research in the development of an algorithm to accurately predict the work-hours at the various EFD/A headquarters is needed. Once both models are established, combine the models to obtain a new NAVFAC algorithm for the EFD/As. The "new" algorithm should be compared against the existing algorithm, by

means of a Cost-Benefit Analysis (CBA), to determine the marginal benefits per unit of cost, which accepts one algorithm over the other. The CBA is required because limited funds and manpower resources must be allocated efficiently and effectively.

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APPENDIX A. POSTS AND DUTIES

A. ROICC/OICC/DROICC

- Train office staff
- Attend meetings (partnering, acquisition planning & strategy meetings, project status, etc.)
- Prepare correspondence
- Travel to division headquarters
- Site Visits
- Site Tours for VIPs
- Prepare the NFOR report
- Troubleshoot (put out fires)
- Brief Preparation/participation
- Staff/Administration (fitreps, evaluations, counseling etc.)
- Review for signature
- Project Site visits and inspections
- Prepare and provide project status management reports to EFA level or division level
- Coordinate/Interface with customers to make sure the contract meets their needs
- Monitor QC/QA/Safety programs
- Develop and administer training plan for the staff

B. RESIDENT ENGINEER/SUPERVISORY ENGINEER

- Project Plans/Constructibility Reviews
- Contract support (SOW, Modification negotiations, Technical Support)
- Health & Safety and AHAs
- Site visits/inspections
- Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)
- Review reports (CMT QA reports)
- Prepare reports (Hotsheets, Command briefs, WIP, Data calls)
- Hazardous waste management (manifests, filing and reports)
- Contractor support (dig/construction/environmental permits, site access)
- Troubleshoot (put out fires)
- Supervise Project Managers

C. AROICC/AREICC/PROJECT MANAGER

- Project Plans/Constructibility Review
- Health & Safety and AHAs
- Site visits for inspection
- Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Production, partnering, design conf. etc.)
- Review reports (CMT QA reports)
- Prepare reports (Hotsheets, Command briefs, WIP, Data calls)

- Hazardous waste management (manifests, filing and reports)
- Contractor support (dig/construction/environmental permits, site access)
- Troubleshoot (put out fires)
- Invoice review & approval
- Brief Preparation
- Modification scoping and estimating
- Negotiate Change Orders
- RFI Reviews
- Submit Reviews (schedule, safety, environmental plans, material etc.)
- Team brief presentations
- Status Reports/File Maintenance
- Warranty Issues
- Contract Close-Out
- Source Selections
- Pre-Award preparations
- Social/Military/VIP Visits/COC
- Claims Analysis
- Daily Office Management/Correspondence
- Monitor Contractor's schedule
- Monitor daily reports; both quality & production
- Resolve change conditions
- Write PCO's
- Coordinate with PW shops (utility outages), Security (road/parking lot closures)

D. CONREP/ENGINEER TECHS

- Contract support (SOW, Modification Negotiations, Technical Support)
- Health & Safety and AHAs
- Site visits for inspection (construction & safety compliance)
- Attend various meetings (CQC, Precon, RAB, BCT, RPM, staff, dig permit, outages, production etc.)
- Review reports (CMT QA reports)
- Prepare reports (Hotsheets, Command briefs, WIP, Data calls)
- Hazardous waste management (manifests, filing and reports)
- Contractor support (dig/construction/environmental permits, site access)
- Troubleshoot (put out fires)
- Respond to Surveys
- Pre-final inspection
- Final inspection
- Punch list inspection
- Three Phases of Inspections
- Submit Reviews
- Team brief presentations
- RFI Review
- Invoice review & approval

- Collateral Duties (vehicle maintenance records, safety coordinator, waste management, crane safety)
- Project Photographs
- Prepare daily reports
- Perform labor interviews
- Review O&M Manuals/As builts

E. SUPERVISORY CONTRACTING OFFICER

- Supervise general personnel (evaluations, training setup, etc)
- Management - long term plans, meetings with upper management
- Solicit and award new contracts
- Administer existing contracts
- Accept and close out contracts
- Various data entry to support contract awards
- Respond to data requests, general inquiries from internal sources
- Respond to requests for information from contractors
- Prepare Delivery Orders/Modifications
- Meeting preparation
- Attend meetings (staff, acquisition planning, team, partnering etc.)
- Invoice review, processing
- SBA Price Adjustments
- Supervisory duties (workload distribution, APAS, guidance, assistance, evaluations etc.)

F. CONTRACTING OFFICER/CONTRACT SPECIALIST

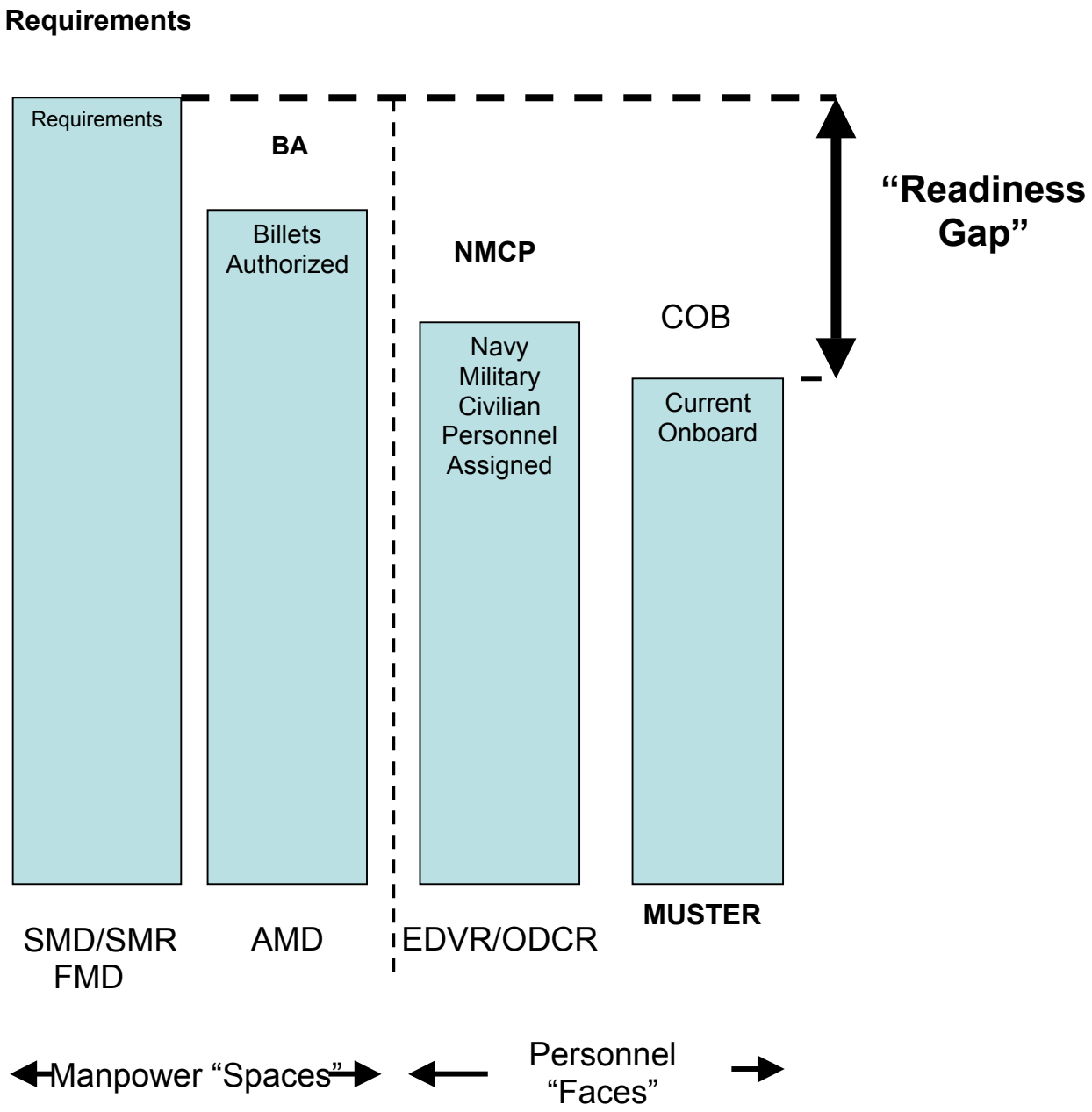
- Administer existing contracts
- Award new contracts
- Data entry
- Respond to data requests/reports
- Respond to requests for information from contractors
- Contract negotiations
- Contract negotiations preparation
- Attend meetings (02, project updates, staff, production meetings)
- Project coordination w/ktr & customers (site visits, pre-design meetings, pre-cons, partnering, etc.)
- Invoice Processing
- Close-Outs (correspondence, archiving, pre-final & final inspections)
- Warranty follow-up
- Plans & specs duplication & review, other pre-award and design rev.
- Review & research of regulations, policies & procedures/training
- Coach SDB
- Review/coordinate submittals
- Troubleshoot (put out fires)
- Solicitation Preparation/Review/Past Performance

- Source Selection TEB
- Fund issues (tracking status/resolution with customers)
- Correspondence (including electronic)
- SCA Price Adjustments
- Prepare task orders & modifications (scope review, issue RFP, issue, distribution etc.)

G. OFFICE AUTOMATION CLERK

- Change the back-up tapes for the computer system
- Maintain office supplies availability
- Help maintain the list of required/ mandatory classes for the staff
- Help the staff with inputting their time into the SLDCADA system (prepare time cards)
- Coordinate conference room
- Pay the monthly office bills
- Prepare list of monthly office expenditures
- Empty recyclables bins
- Help manage BOA contractors files, lists, etc.
- Research the costs of special exp/items-service for the office staff
- Check the Pronet and CCR for records on Contractors
- Attend meetings
- Maintain contract files (filing, payroll rev, new files, c/o binder)
- Data entry for Information Systems (FIS, NAFI, ACASS/CCASS/FAIR)
- Receive visitors/phone calls, mail runs/distribution
- Technical library management/updates
- Invoice Processing
- Close-outs (archiving, purging files, notify PM to recapture funds)
- Train/Travel (orders, claims, arrangements)
- Contractor requests for employee badges
- Prepare reports (labor, copier, purchase cards)

APPENDIX B. READINESS GAP[33]



33 CDR W. D. Hatch II, NPS Monterey, MN 2111 Manpower, Personnel and Training Seminar I Summer 2002, Slide # 32.

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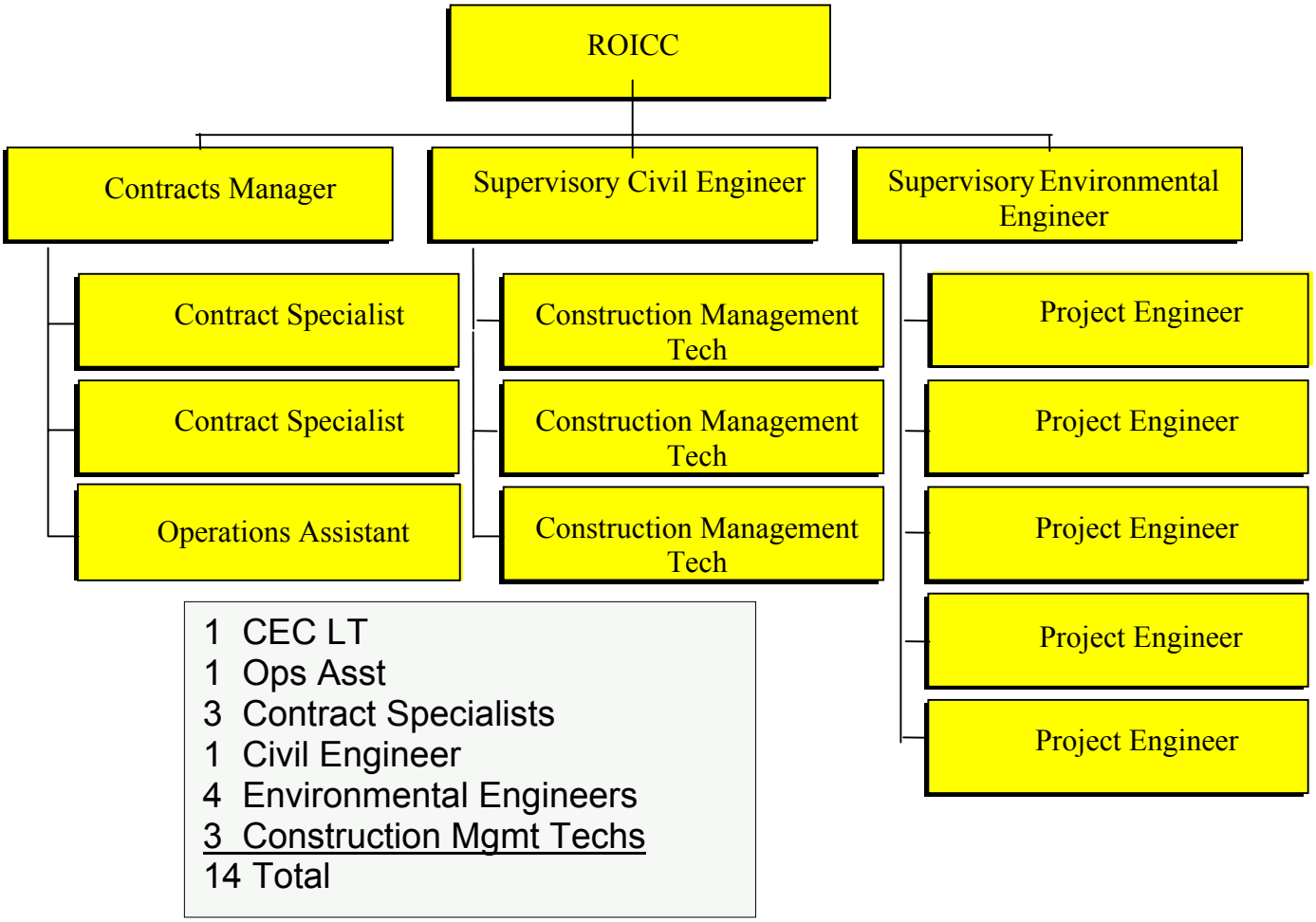
APPENDIX C. ROICC OFFICES

A. ROICC SAN FRANCISCO (ALAMEDA)

1. Organizational Chart



2. Mission Function Tasking Statement

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
Contract Specialist	Administering existing contracts	5	W	25
	Soliciting and awarding new contracts	2	W	2
	Data entry to support contract admin/contract awards	5	W	8
	Closing out contracts	1	W	1
	Responding to data requests/reports	1	W	1
	Responding to requests for information from contractors	5	W	2
	Staff meetings	1	M	1
Operations Assistant	Office Mail Organization	9	D	0.5
GS-06	Changing the Back-up Tapes for our Computer System	1	D	0.1
	Maintaining Office Supplies availability	5	M	0.3
	Maintain the Contract Files at both Alameda and Moffett	6	W	3.5
	Help maintain the list of required/ mandatory classes for the staff	1	W	0.3
	Help the staff with inputting their time into the SLDCADA system	1	W	1.3
	Set up and reserve the conference room for meetings for the Staff	4	M	0.15
	Pay the Monthly Bills/ Expenses by Credit Card	5	M	0.3
	Put together the Monthly Expenditures of my Gov'nt Credit Card	1	M	1
	Empty all the Paper/ Plastic Recylables in the Bins	1	W	1
	Help Manage BOA Contractors files, lists, etc.	7	M	0.5
	Research the costs of special exp/items-service for the Office Staff	1	M	1
	Check the Pronet and CCR for records on Contractors	1	M	0.3
	E-mails	1	D	0.3
	Training	14	Y	1
	Reports	3	M	3
Construction Management Tech	Project Plans/Constructibility Review/Safety Plans	4	M	1.5
	Contract support (SOW, Mod. Negotiations, Technical Support)	2	M	4
	Health & Safety and AHAs	4	M	1.5

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
	Site visits (Inspections)	1	W	1
	Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)	1.75	D	1.5
	Review of reports (CMT QA reports)	1	D	1.5
	Site Visits	2	M	4
	E-mail/correspondence/Junk Mail Surveys Like This One	2	D	1.5
	Hazardous waste management (manifests, filing and reports)	3	M	3
	Contractor support (dig/construction/environmental permits, site access)	2	W	4
	Training	1	W	1
	Put out fires/Misc Catch-up (filing/regulation vio/checking specs)	5	W	3
	Driving To/From Bases	30	M	2.25
	Pre-final	2	M	4
	Finals	1	M	3
	Punchlist Item Repairs	1	M	8
	Three Phases of Inspections	20	M	1
	Snooping New World Tech. For No Mil-Con	2	M	2.25
	Telephone To Keep People in the Loop	2	D	1.5
Engineering Tech	Project Plans/Constructibility Review	1	W	3
	Contract support (SOW, Mod. Negotiations, Technical Support)	1	W	3
	Health & Safety and AHAs	2	W	3
	Site visits (Inspections)	5	W	15
	Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)	2	W	3
	Review of reports (CMT QA reports)	5	W	3
	Prepare reports (Hotsheets, Command briefs, WIP, Data calls)			
	E-mail/correspondence	5	W	3
	Hazardous waste management (manifests, filing and reports)	2	W	3
	Contractor support (dig/construction/environmental permits, site access)	1	W	3
	Training	1	W	1
	Put out fires			

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
Engineering Tech	Project Plans/Constructibility Review	1	W	2
	Contract support (SOW, Mod. Negotiations, Technical Support)	1	W	3
	Health & Safety and AHAs	2	W	3
	Site visits (Inspections)	5	W	7
	Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)	2	W	5
	Review of reports (CMT QA reports)	5	W	3
	Prepare reports (Hotsheets, Command briefs, WIP, Data calls)	2	W	1
	E-mail/correspondence	12	W	6
	Hazardous waste management (manifests, filing and reports)	2	W	2
	Contractor support (dig/construction/environmental permits, site access)	3	W	4
	Training	1	W	1
	Put out fires	5	W	3
Project Engineer	Project Plans/Constructibility Review	1	W	4.0
	Contract support (SOW, Mod. Negotiations, Technical Support)	1	W	4.0
	Health & Safety and AHAs	1	W	1.0
	Site visits (Inspections)	6	W	7.0
	Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)	3	W	6.0
	Review of reports (CMT QA reports)	1	W	2.0
	Prepare reports (Hotsheets, Command briefs, WIP, Data calls)	2	W	3.0
	E-mail/correspondence	15	W	5.0
	Hazardous waste management (manifests, filing and reports)	1	W	1.0
	Contractor support (dig/construction/environmental permits, site access)	3	W	3.0
	Training	1	W	1.0
	Put out fires	5	W	3.0
Project Engineer	Project Plans/Constructibility Review	1	M	8
	Contract support (SOW, Mod. Negotiations, Technical Support)	2	Y	13
	Health & Safety and AHAs	1	M	12
	Site visits (Inspections)	1	D	2
	Attend meetings (CQC, Precon,	2	W	4

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
	RAB, BCT, RPM, Staff, Others)			
	Review of reports (CMT QA reports)	1	D	1
	Prepare reports (Hotsheets, Command briefs, WIP, Data calls)	1	W	1
	E-mail/correspondence	1	D	2
	Hazardous waste management (manifests, filing and reports)	1	D	1
	Contractor support (dig/construction/environmental permits, site access)	1	W	1
	Training	1	W	1
	Put out fires	1	W	1
Supervisory Contracting Officer	Supervisory - mentoring	5	W	5
	Supervisory - general personnel (evals, training setup, etc)	1	W	2
	Management - long term planning, meeting with upper management	2	W	2
	Soliciting and awarding new contracts	5	W	5
	Administering existing contracts	5	W	15
	Accepting and closing out contracts	1	W	1
	Various data entry to support contract awards	2	W	2
	Staff meetings	1	W	1
	Responding to data requests, general inquiries from internal sources	1	W	1
	Responding to requests for information from contractors	1	W	1
	Other general office support and morale issues	5	W	5
Supervisory Engineer	Project Plans/Constructibility Review			
GS-13	Contract support (SOW, Mod. Negotiations, Technical Support)	3	W	2
	Health & Safety and AHAs	1	W	1
	Site visits (Inspections)	2	W	4
	Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)	2	W	2
	Review of reports (CMT QA reports)			
	Prepare reports (Hotsheets, Command briefs, WIP, Data calls)	2	W	4
	E-mail/correspondence	5	W	20

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
	Hazardous waste management (manifests, filing and reports)			
	Contractor support (dig/construction/environmental permits, site access)			
	Training	1	W	1
	Put out fires	1	W	1
	Supervision	5	W	5
Project Engineer	Project Plans/Constructibility Review	1	W	1
	Contract support (SOW, Mod. Negotiations, Technical Support)	1	W	1
	Health & Safety and AHAs	2	W	2
	Site visits (Inspections)	3	W	9
	Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)	3	W	3
	Review of reports (CMT QA reports)			
	Prepare reports (Hotsheets, Command briefs, WIP, Data calls)	5	W	5
	E-mail/correspondence	5	W	15
	Hazardous waste management (manifests, filing and reports)	2	W	2
	Contractor support (dig/construction/environmental permits, site access)	1	W	1
	Training	1	W	1
	Put out fires			0
ROICC	Training	4	W	4
	Meetings	2	M	1
	Correspondence	8	D	0.5
	Travel to SWDIV	6	Y	12
	Teleconference with SWDIV	1	M	1
	Site Visits	1	M	6
	Site Tours for VIPs	4	Y	6
	Reports	6	M	2
	Putting out Fires	1	D	1
	Safety	1	W	1
	Office Staff meetings/functions	2	M	3
Project Engineer	Project Plans/Constructibility Review	1	W	4
GS-12	Contract support (SOW, Mod. Negotiations, Technical Support)	1	W	2

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
	Health & Safety and AHAs	2	W	2
	Site visits (Inspections)	4	W	9
	Attend meetings (CQC, Precon, RAB, BCT, RPM, Staff, Others)	2	W	2
	Review of reports (CMT QA reports)	5	W	2.5
	Prepare reports (Hotsheets, Command briefs, WIP, Data calls)	2	W	1
	E-mail/correspondence	5	W	12
	Hazardous waste management (manifests, filing and reports)	2	W	3
	Contractor support (dig/construction/environmental permits, site access)	1	W	0.5
	Training	1	W	1
	Put out fires	1	W	1
Contract Specialist	Administering existing contracts	5	W	25
	Soliciting and awarding new contracts	2	W	2
	Data entry to support contract admin/contract awards	5	W	8
	Closing out contracts	1	W	1
	Responding to data requests/reports	1	W	1
	Responding to requests for information from contractors	5	W	2
	Staff meetings	1	M	1

3. Distance and Complexity

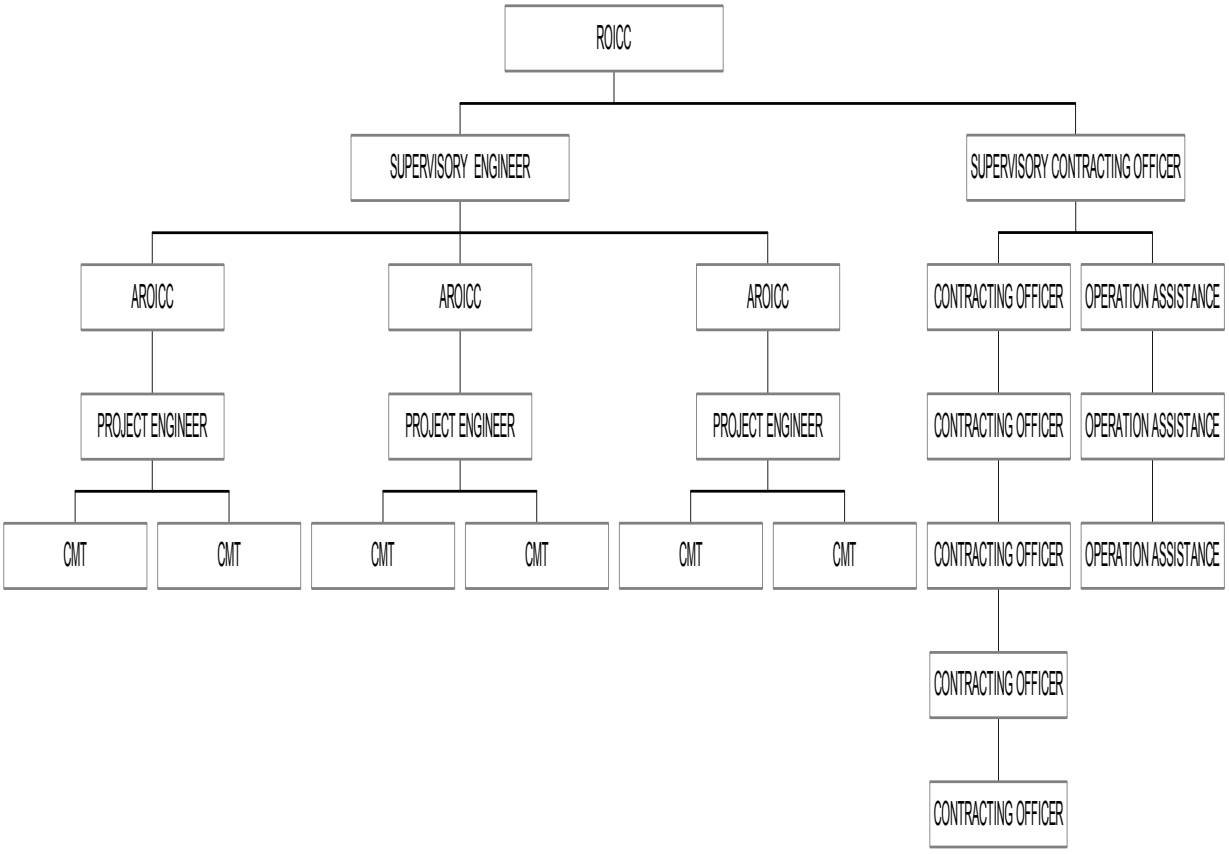
Title of person (e.g. AROICC, Con-rep)	Title of contract/contract number	Distance (Miles)	Round trip #	Period (D, W, M, Y)	Time Spent Round Trip	Complexity Rating
Operations Assistant	Drive to Moffett Field to help with their Filing	20	1	Monthly	1.00	2
Construction Management	Hunters Point CTO 4, 70, 72, 46	36	1	D	2.00	5+
Tech	Point Molate	53	2.5	M	1.50	5+
	Mare Island	93	24	Y	2.15	5+
	Novato	58	4.5	Y	3.00	3
	Moffett Field	88	6	Y	3.00	3
Engineering Tech	Treasure Island - 98-D-2076 CTO 12,36,43,45,89,99	25	1	W	1.50	3
	NMCRC ALAMEDA 99-G-6022	5	2	W	0.50	3
	ALAMEDA POINT 98-D-2076 CTO 13,37,38,60,78,88	3	5	W	0.50	3
	Alameda Point 97-D-5713 CTO 40	1	5	W	0.10	3

Title of person (e.g. AROICC, Con-rep)	Title of contract/contract number	Distance (Miles)	Round trip #	Period (D, W, M, Y)	Time Spent Round Trip	Complexity Rating
Engineering Tech	RAC N62474-98-D-2076; CTO #04 & 86					
	Crows Landing, CA.	100	3	M	4.00	3
	N44255-95-D-6030; CTO #090, 86, 32, 48, Moffett Fed Airfield	10	10	W	0.50	3
	N62474-99-G-6093;CDO # 028; NMC Res Ctr San Jose Repair Roofs on Bldgs 1 & 4	12	5	M	1.00	3
	N6274-99-G-6093;: D0 23, Moffett Field, CA. Canopy Installation, Fire Sprinkler, & electrical work	2	1	W	0.50	3
	Civil Works Lockheed Sunnyvale.CA	5	3	Y	0.50	3
	Santa Cruza, CA	100	1	Y	4.00	3
Project Engineer	***RAC N62474-98-D-2076; CTO #04 Crows Landing***					
	SVE Optimization at UST Cluster 1 & Remediation	90	3	M	3.50	3
	RAC N62474-98-D-2076; CTO #086 Crows Landing					
	Verification Activities at Various Sites & Removal Actions	90	3	M	3.50	3
	RAC N44255-95-D-6030; CTO #090 Moffett Fed Airfield					
	EATS/WATS Optimization & O&M Activities at Var Sites	3	18	M	0.50	3
	RAC N68711-98-D-5713; CTO #032 Moffett Fed Airfield					
	IR Site 22 Landfill Construction of Biotic Barrier	3	18	M	0.50	3
	RAC N68711-98-D-5713; CTO #048 Moffett Fed Airfield					
	EATS/WATS Optimization & O&M Activities at Var Sites	3	18	M	0.50	3
	N62474-99-G-6093;CDO # 028; NMC Res Ctr San Jose	12	5	M	1.00	3
	Repair Roofs on Bldgs 1 & 4					
Project Engineer	Fuelline/contaminated soil removal at Mare Island	30	3	W	1.5	3
	Mare Island storm drain cleaning	30	2	W	2.00	3
	Landfill soil cover at Point Molate	18	3	W	1.00	3
	AST removal and O&M at Point Molate	18	3	W	1.00	3
	Landfill excavation T&D of soil at Skaggs Island	37	2	W	2.00	3
	O&M of groundwater treatment plant at Point Molate	18	1	W	1.00	2
	Fuelline removal at Point Molate	18	3	W	1.00	3
	DNAPL remediation at Sites 4 & 5, Alameda	0.5	1	D	1.00	3
	Hydrocarbon remediation at Alameda Point	1	1	D	1.00	3
	Fuelline removal at Alameda Point	1	1	D	1.00	3
	Sites 1 & 2 investigation, Alameda Point	2	3	W	1.00	3

Title of person (e.g. AROICC, Con-rep)	Title of contract/contract number	Distance (Miles)	Round trip #	Period (D, W, M, Y)	Time Spent Round Trip	Complexity Rating
Supervisory Engineer	San Bruno Res Cen, Bldg 1 Repairs	25	1	W	1.50	3
	San Bruno Res Cen, Fence & Paving	25	1	W	1.50	3
	San Bruno Res Cen, Water Line Repair	25	2	W	1.50	3
	Alameda Res Cen, Seawall	4	3	W	0.60	3
	Alameda Res Cen, Lighting Upgrade	4	1	W	0.60	3
	Alameda Res Cen, Fire Alarm Upgrade	4	1	W	0.60	3
	Alameda Res Cen, Door Repairs	4	1	W	0.60	3
	Alameda Res Cen, Roof Repairs	4	1	W	0.60	3
	Alameda Res Cen, Heating and Ventilation Repairs	4	1	W	0.60	3
	San Jose Res Cen, Bldg 1 Repairs	40	2	M	2.00	2
	San Jose Res Cen, Bldg 2 Repairs	40	1	W	2.00	3
	San Jose Res Cen, Reroof Bldgs 1 & 4	40	2	M	2.00	2
	DeCA Sacramento, Relocate Gas Meter	60	1	W	2.00	1
	DeCA Sacramento, Computer Room Alterations	60	1	W	2.00	3
	DeCA Travis AFB, Produce Ramp and Vestibule Floor	25	1	W	1.10	1
	DeCA Moffett, Canopy and Pigeon Netting	40	2	M	2.00	2
	DeCA S.F. Presidio, Remove Refrigerant	25	1	W	1.50	1
	USGS Menlo Park, Research Facility	35	2	M	2.00	3
Project Engineer	Treasure Island, N62474-98-D-2076 CTOs 12,36,43,45,89,99	25	1	W	1.50	3
	Hunters Point, N62474-98-D-2076 CTO 82, N68711-98-D-5713, CTOs 46,70,72, Several Other Fixed Price Contracts	40	2	W	2.00	3
Project Engineer	Alameda Point 98-D-2076 CTO 13,37,38,59,88,71,76	4	4	W	0.60	3
	Alameda Point 97-D-5713 CTO 40	1	4	W	1.00	3

B. ROICC LEMOORE

1. Organizational Chart



2. Mission Function Tasking Statement

Position Description (Rank or GS level)	Task	AVG # of times performed per period	Period D, W, M, Y	Wkly Hrly Avg/Person
Supv Cont Spec GS-13	Delivery Orders/Mods	2	W	0.5
	Meeting preparation	3	W	3
	Meetings (staff, acquisition planning, team)	6	W	7
	Partnering mtgs	4	Y	1
	Invoice review, processing	6	M	4.5
	Solicitation preparation/discussions	25	Y	0.5
	SBA Price Adjustments	3	Y	0.5
	Supervisory duties (wkld distr, APAS, guidance, assistance)			20
	Phone calls	30	W	5
	Leave (annual, sick)	2	Y	4

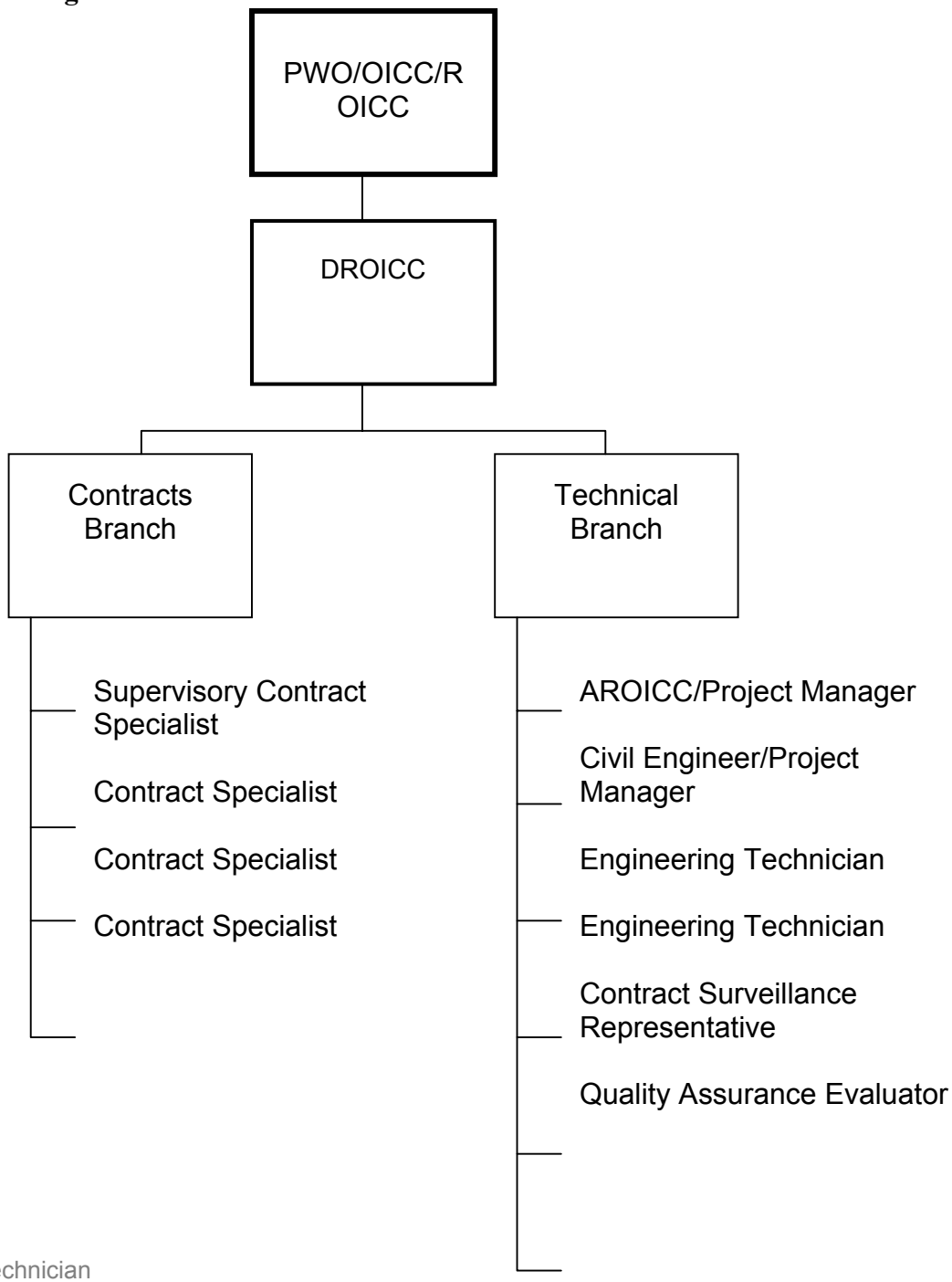
Position Description (Rank or GS level)	Task	AVG # of times performed per period	Period D, W, M, Y	Wkly Hrly Avg/Person
	Misc.		D	1
Operations Assistants	Process invoices	80	M	15
(composite of 3 GS-06s)	Payroll reviews	120	M	4
	Contractor requests for employee badges	10	D	2
	Credit Card Purchases/Reconcile statement	5	M	2
	Reports (labor, copier, purchase cards)	10	Y	1
	File (create, maintain, close-out)	15	W	4
	FIS/NAFI/timecards	120	W	2
	Phone calls	20	D	1
	Travel Orders	5	M	2
	Assist Visitors	5	D	1
	Site Visit Arrangements (security/transportation)	2	M	2
	Leave (annual, sick)	2	Y	4
Contract Specialists				
(composite of 4 GS-12s and 1 GS-11)	Solicitation Preparation/Review/Past Performance	2	W	2
	Site Visits	1	W	3
	Pre-Construction/Pre-Performance Mtgs	2	W	2
	Design Mtgs	1	M	1
	Meetings (Progress/Control, ROICC, Staff, Team)	3	W	7
	Financial Issues (DFAS)	3	W	1
	Process Invoices	10	M	1.5
	Mandatory Training	1	Y	1
	Source Selection TEB	1	Y	1
	Travel to meetings/training	1	W	0.5
	Funding issues (tracking status/resolution with customers)	5	D	1.5
	FIS	1	D	0.5
	SPS	1	D	5
	NAFI	1	D	0.5
	Correspondence (including		D	2

Position Description (Rank or GS level)	Task	AVG # of times performed per period	Period D, W, M, Y	Wkly Hrly Avg/Person
	electronic)			
	Scanning/filing documents		D	0.5
	SCA Price Adjustments	25	A	2
	Phone calls		D	1
	Reports (data calls, DD350 reports, acq status updates)		M	0.5
	Partnering Mtgs	4	Y	1
	Awards/Task Orders/Modifications (GE, scope review, issue RFP, negotiations, issue, distribution, FEDBIZOPS, e-sol)		D	3.5
	Timecards	2	M	0.5
	Leave (annual, sick, compensatory)		Y	4.5
AROICCs				
(composite of 3 - LT, LTJG, ENS)	Negotiating Modifications	2	W	1.5
	Job visits	5	W	12
	Letters/Documentation/E-mails	5	W	7.5
	Scheduled Meetings	4	W	4
	Unscheduled Meetings	2	W	2
	Status Reports/File Maintenance	5	W	5
	Warranty Issues	3	W	3
	Contract Close-Out	1	W	0.5
	Source Selections	1	Y	0.5
	Pre-Award	1	M	1
	Partnering	3	W	3
	Specification Reviews	3	W	5
	Post-Award Proceedings	1	W	2
	Invoice Processing	5	W	2.5
	TAD/Training	8	Y	5
	Social/Military/VIP Visits/COC	5	Y	1
Engineers				
(Composite of 3 GS-12s)	Design Conferences	14	Y	2
	Constructibility Review	4	Y	2.5
	Process Contractor Submittals	50	M	8

Position Description (Rank or GS level)	Task	AVG # of times performed per period	Period D, W, M, Y	Wkly Hrly Avg/Person
	Process RFIs	10	M	4
	Process Contract Modifications	15	Y	3
	Construction Site Visits	18	Y	3
	Claims Analysis	2	Y	1
	QC Meetings/Quality Assurance	1	W	3
	Miscellaneous Technical Support			3
	Daily Office Management/Correspondence	4	W	4
	Safety Issues	3	M	5
	Leave (Annual, Compensatory, Sick)			4.5
CMTs				
(Composite of 6 GS-11s)	Site Visits: AA Work/Review		D	13
	Construction Management		D	9
	Safety		D	5
	Time to/fm construction sites		D	5
	RFI Review		W	1.5
	Submittal Review		W	1.25
	Activity Hazard Analysis Review			1.5
	QC Meetings		W	2.5
	Staff/Team Meetings		W	2.75
	Customer Meetings			2.4
	Conduct Site Visits			0.5
	Pre-Construction Meetings			0.5
	Invoice Processing		M	1.25
	Design Review			1.8
	Coordinate Power Outages			0.8
	Training			1.25
	Design Meetings/Source Section TEBs			0.75
	Collateral Duties (vehicle maintenance records, safety coordinator, waste mgmt, crane safety)			0.25
	Leave (Annual, Compensatory, Sick)			3

C. ROICC MONTEREY

1. Organizational Chart



0802 - Engineering Technician
0810 – Civil Engineer
1101 – Contract Surveillance Representative
1102 – Contract Specialist
1910 – Quality Assurance Evaluator

Total ROICC Personnel
3 Military
9 Civilian (7 EFA, 2 PWD)

2. Mission Function Tasking Statement

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
DROICC/LT	Prepare and provide project status through management reports (EFA West, NPS, other clients)	16	M	1
	Chair project update meetings with ROICC Contract and Technical supervisors	1	W	1
	Project outage coordination with the PWO/NPS	1	W	2
	Project site tour	3	W	2
	Coordinate/Interface with customers to make sure the contract meets his/her needs	4	W	1
	Mentor/Train AROICC	2	W	1
	Partnership with contractor and client	3	Y	2
	Attend acquisition planning & strategy meetings	1	W	1.5
	Monitor QC/QA/Safety programs	2	W	2
	Develop and administer training plan for the staff	1	M	2
Proj Mgrs/GS-12/LTJG	Monitor Contractor's schedule	1	W	2
(Civil Eng & AROICC)	Process billings/invoice/pay estimates wi/ contractor's supv	1	W	2
	Monitor daily reports; both quality & production	5	W	1
	Resolve change conditions	2	M	2
	Coordinate RFI's with the PW/EIC and respond	3	M	1
	Write PCO's	3	M	1
	Monitor safety conditions on the job site as well as review and	5	W	2
	Monitor contract's quality control program	5	W	2
	Hold periodic QC/production meetings with contractor	3	W	1.5
	Coordinate with PW shops(utility outages), Security(road/parking lot closures	4	M	2
Eng'g Tech/GS-11	Coordinate PW outages, closures, Base (PAO, Safety, Security, Environment)	4	M	2
	Project Photographs	1	M	2
	Daily Reports	1	D	2
	Meeting with contractor(QC, Production)	3	W	1.5
	Quality Assurance	5	W	4
	Invoices	1	W	2

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
	Labor interviews	4	Y	2
	Punchlist	2	M	2
	O&M Manuals As builts	3	M	1
	Material submittals review	1	W	2
CSR	Coordinate power outages, base PAO, safety .security.	4	M	2
	Project Photographs	1	M	2
	Daily reports	1	D	1
	Meetings with the contractor QC.	3	D	1
	Invoices	1	M	1
	punchlist	2	M	2
	O&M Manuals as builts	3	M	1
	Material submittals reviews	1	M	2
	Janitorial QA.	1	D	1.5
	Landscape QA.	1	D	1.5
	Refuse QA.	1	D	1
	Tree contract housing and post contract QA.	1	D	1

3. Distance and Complexity

Title of contract/contract number	Distance (Miles)	Round trip #	Period (D,W,M,Y)	Time Spent Round Trip (Hours)	Complexity Rating (AROICC/PM, ET/CSR)
Troubleshoot transformer/ N62474-00-M-2001	1	1	W	0.16	2
Repair damaged transformer / N62474-00M-2002	1	1	W	0.16	2
FNOC Clean vent ducts / N62474-00-M-2003	4	1	W	0.42	3
Remove & replace carpets / N62474-00-M-2004	1	1	W	0.16	3
Streetsweeping service / N62474-00-M-2005	2	1	D	0.25	3
Provide landscaping service / N62474-00-M-2008	1	1	D	0.25	2
Install curtain wall / N62474-00-M-2009	1	1	W	0.16	1
Teledyne LAAR Boiler / N62474-00-M-2011	2	1	W	0.25	2
Construct 4 foot high fence / N62474-00-M-2012	2	1	W	0.25	2
IO Tree trimming &	2	1	D	0.25	3

Title of contract/contract number	Distance (Miles)	Round trip #	Period (D,W,M,Y)	Time Spent Round Trip (Hours)	Complexity Rating (AROICC/PM, ET/CSR)
removal / N62474-00-D-2013					
Carpet IO NPS / N62474-00-D-2014	1	1	W	0.16	1
Water intrusion investigation / N62474-00-M-2015	1	1	W	0.16	1
Repaving at LMV / N62474-00-C-2017	2	1	W	0.25	3
Remove & replace carpets / N62474-00-M-2018	1	1	W	0.16	1
Window tinting at LMV / N62474-00-M-2019	3	1	W	0.33	1
Provide and install Wheel / N62474-01-M-7004	1	1	W	0.16	1
Pump Control Repairs / N62474-01-M-7005	1	1	W	0.16	1
Provide elevator service / N62474-01-M-7006	1	1	W	0.16	1
Install Carpet 327 Fitch / N62474-01-M-7008	2	1	W	0.25	1
Provide elevator repairs / N62474-01-M-7009	1	1	W	0.16	1
Repair Fire Alarm Navy Lodge / N62474-01-M-7011	3		W	0.33	2
IDO to furnish and install / N62474-01-D-7013	1	1	W	0.16	1
Carpet Installation / N62474-01-M-7014	2	1	W	0.26	2
Provide and install New floor / N62474-01-M-7015	1	1	W	0.16	1
Furniture move / N62474-01-M-7016	1	1	W	0.16	1
Ground maintenance service / N62474-01-M-7018	3	1	D	0.33	2
Repair freight elevator / N62474-01-M-7020	1	1	W	0.16	2
Vehicle rental / N62474-01-D-7021	1	1	D	0.16	1
Terminate Fiber Optic Cab / N62474-01-M-7022	1	1	W	0.16	1
Bus shuttle service / N62474-01-M-7023	1	1	W	0.16	1
Window washing exterior / N62474-01-M-7024	2	1	W	0.25	1
Repair Onan generator / N62474-01-M-7025	2	1	W	0.25	1

Title of contract/contract number	Distance (Miles)	Round trip #	Period (D,W,M,Y)	Time Spent Round Trip (Hours)	Complexity Rating (AROICC/PM, ET/CSR)
Trim Remove Trees / N62474-01-D-7026	3	1	D	0.33	2
Full elevator maintenance / N62474-01-C-7027	2	1	W	0.25	1
Shuttle Bus service / N62474-02-M-8001	1	1	W	0.16	1
Acid Clean Boiler #2 / N62474-02-M-8004	1	1	W	0.16	1
Furnish and install blast / N62474-02-M-8005	1	1	W	0.16	1
Relocate eqt in Halligan Hall / N62474-02-M-8007	1	1	W	0.16	1
Provide and install 18 NE / N62474-02-M-8009	1	1	W	0.16	1
Troubleshoot and repair elevator / N62474-02-M-8011	2	1	W	0.25	1
Asphalt repairs at LMV / N62474-02-M-8012	3	1	D	0.33	3
Mold remediation at various location / N62474-02-M-8013	6	1	D	0.58	2
Create silk screen ceiling / N62474-02-M-8016	2	1	W	0.25	2
Street resurfacing at NPS / N62474-02-C-8017	2	1	D	0.25	1
Repair Public address / N62474-02-M-8018	2	1	W	0.25	2
Construct partition at Halligan Hall / N62474-02-M-8019	1	1	W	0.16	2
Golf Course Clubhouse Renovation / N62474-02-C-8029	2	1	D	0.25	2
Grounds Maintenance Service / N62474-97-D-2620	5	1	D	0.5	2
Install soil sod plants / N62474-97-M-2665	5	1	D	0.5	2
Remodel 2nd 3rd floor Herrmann hall / N62474-97-M-2681	1	1	W	0.16	4
Janitorial contract / N62474-97-D-2684	4	1	D	0.5	3
Multi Trade work / N62474-98-D-3601	2	1	D	0.25	3,3
Steam Clean Kitchen /	1	1	W	0.16	1

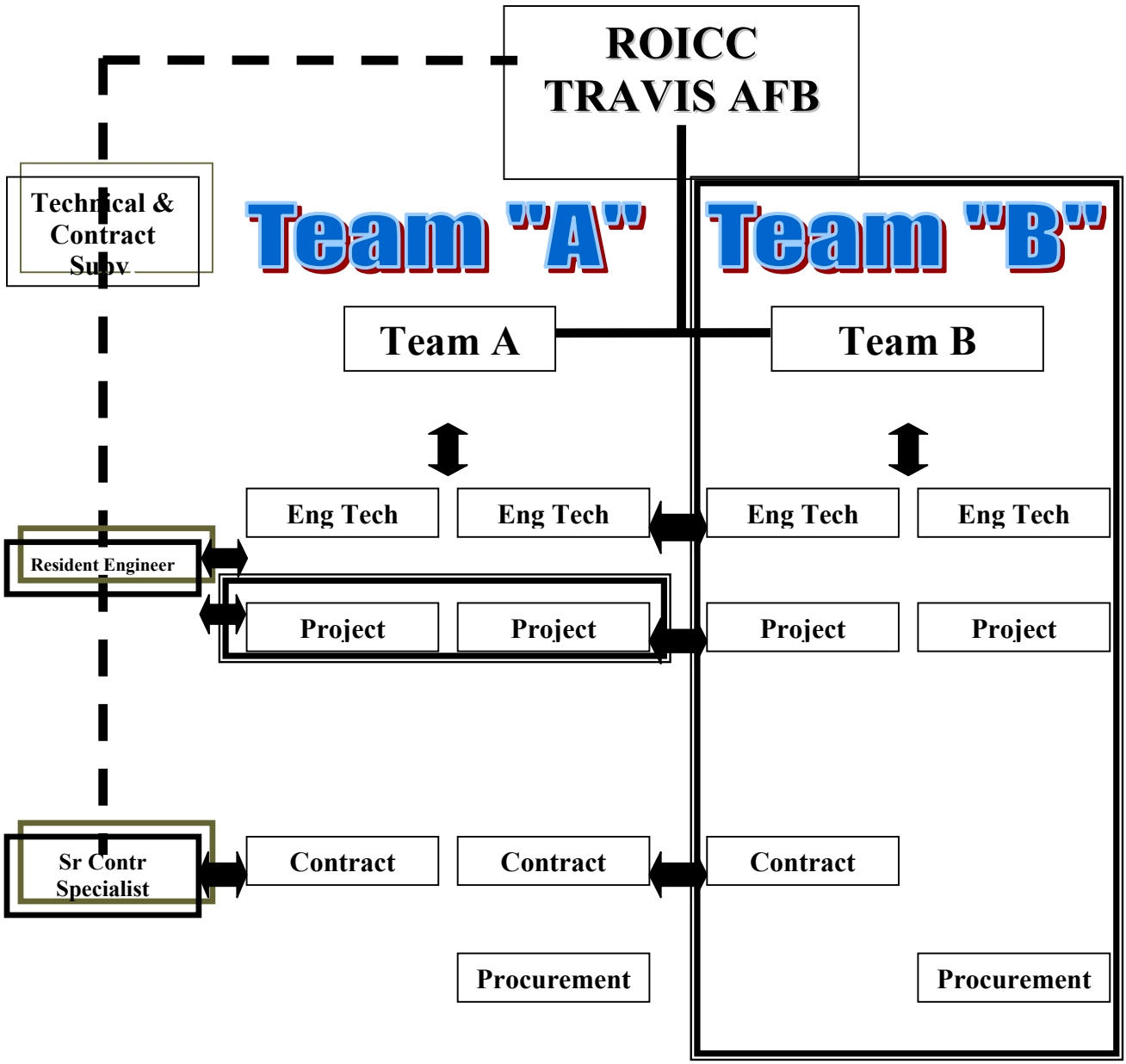
Title of contract/contract number	Distance (Miles)	Round trip #	Period (D,W,M,Y)	Time Spent Round Trip (Hours)	Complexity Rating (AROICC/PM, ET/CSR)
N62474-98-M-3602					
Weighing Testing Servicing / N62474-98-M-3603	1	1	W	0.16	1
Replace window bldg 23 / N62474-98-M-3604	2	1	W	0.25	2,2
Drill test and develop well / N62474-98-M-3610	2	1	W	0.33	1
Install soil sod plants /N62474-98-M-3613	5	1	W	0.5	1
Install Handrails / N62474-98-M-3614	1	1	W	0.16	1
Janitorial service / N62474-98-M-3617	4	1	D	0.5	3
Refuse collection / N62474-98-D-3618	3	1	D	0.42	3
Install Handrails / N62474-98-M-3623	2	1	W	0.25	1
Provide high voltage maintenance / N62474-98-M-3624	1	1	W	0.16	2
Interior plant maintenance / N62474-98-M-3626	1	1	D	0.16	1
Change of Occupancy Maint / N62474-99-D-7000	2	1	W	0.25	3,4
Emergency repair of failed elevator / N62474-99-M-7001	1	1	W	0.16	2
Repair high voltage maintenance / N62474-99-M-7002	1	1	W	0.16	2
Rodent control at NSA / N62474-99-M-7003	1	1	W	0.16	2
Utility infrastructure / N62474-99-M-7004	1	1	W	0.16	1
Emergency repair of Gas line / N62474-99-M-7007	1	1	D	0.16	1
IDIQ multiple DO / N62474-01-D-7000	3	1	D	0.42	2,1
Whole sale revitalization / N62474-00-C-3013	5	1	W	0.75	3,2
Whole house TO 139 officer / N62474-00-C-3016	5	1	D	0.75	3,2
ME Extension / N62474-00-C-3035	1	1	D	0.5	4,3
Bullard Hall Renovation / N62474-00-C-3015	2	1	D	0.5	4,3
HR293 Demo 284 Wherry	1	1	W	0.16	2,3

Title of contract/contract number	Distance (Miles)	Round trip #	Period (D,W,M,Y)	Time Spent Round Trip (Hours)	Complexity Rating (AROICC/PM, ET/CSR)
Unit / N62474-97-C-1580					
Navy Lodge Monterey / N62474-98-C-2002	3	1	D	0.42	4,4
Wholesale repairs TO 75 / N62474-98-C-2098	5	1	D	0.75	4
Demo Bldg 223/223A / N62474-99-C-6029	1	1	W	0.16	3,3
Fitness Center / N62474-99-C-6090	1	1	D	0.16	5,3
Pineview townhouse / N62474-00-C-3016	6	1	D	0.58	5,3
Library HVAC Repairs / N68711-00-D-0701/0205	1	1	D	0.16	3,2
Replace windows Hermann Hall / N62474-99-G-6094/0003	1	1	D	0.16	4
Trident Renovation / N62474-99-G-6094	1	1	D	0.16	3,2
Demolish 6 NPS buildings / N62474-99-G-3235	3	1	D	0.42	4,2
Replace Boiler Deaerator Tank / N62474-99-G-6094/0008	2	1	W	0.25	3
Renovate B436 and Demo 203 / N62474-99-G-3235/0001	1	1	D	0.16	3
NEX HVAC Repairs / N68711-00-D-6701/0295	1	1	D	0.16	3,2
Renovate SCIF Glasgow / N68711-00-D-0701/0196	2	1	D	0.25	4,4
Spanagel Hall HVAC repair / N62474-99-G-3219/0004	1	1	D	0.16	3
Knox Library Fire suppression Replacement / N62474-99-G-3204/0007	2	1	D	0.25	4
Paint B245 / N62474-99-G-3204/0006	1	1	W	0.16	2
Replace B245 window shades / N62474-02-D-8010/0004	1	1	D	0.16	3
Replace B245 entry doors / N62474-02-D-8010/0005	1	1	D	0.16	3
Install Ingersol A/C / N62474-99-G-3218/0004	1	1	D	0.16	3
Replace FA at NEX / N62474-99-G-3218/0003	1	1	D	0.16	2,2
Install gas & elect meters	3	1	W	0.42	1

Title of contract/contract number	Distance (Miles)	Round trip #	Period (D,W,M,Y)	Time Spent Round Trip (Hours)	Complexity Rating (AROICC/PM, ET/CSR)
LMV / N62474-99-G-3235/0013					
Cell phone booster / N62474-03-M-3012	1	1	W	0.16	2
Electrical upgrades BOQ / N62474-99-G-6093/0027	1	1	D	0.5	4
Renotate Information Tours / N62474-99-G-3235/0012	1	1	D	0.16	3,3
War Game Barrier wall / N62474-01-D-6001/0012	1	1	W	0.16	1
Irrigation upgrades design / N62474-01-D-6001/0010	NA	1	W	0.16	2
ATFP Security lighting design / N62474-01-D-6001/0012	NA	1	W	0.06	2
Repair Feeder B loop NPS / N62474-99-G-3219/0005	1	1	D	0.16	3,3
Replace sidewalk Root Hall / N62474-03-M-3014	2	1	W	0.25	2
Repair numerous roofs OMC / N62474-99-G-6093/0035	6	1	D	0.83	3
Renovate QTRS F&G / N62474-03-G-2012/0001	2	1	D	0.25	3,3
Walking Trail repairs / N62474-99-G-3223/0005	1	1	D	0.16	3,3
Sidewalks/Lighting Various location NPS / N62474-99-G-3223/0004	1	1	D	0.16	2
Provide water fowl control measure NPS / N62474-03-M-3031	3	1	W	0.42	1
Multiple DO IDIQ / N62474-02-D-8010	3	1	D	0.42	2,2,2

D. ROICC TRAVIS

1. Organizational Chart



2. Mission Function Tasking Statement

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
Contract Specialist (4 pers. - (1) GS-13, (2) GS-12, (1) GS-11	Negotiations including preparation	12	M	16
	Meetings (02, project updates, staff, production meetings)	21	M	40
	Information Systems	12	M	12
	Project coordination w/ktr & customers (outages, site visits, pre-			
	design mtgs, pre-cons, partnering, etc.)	20	M	20
	Invoice Processing	3	M	6
	Close-Outs (correspondence, archiving, pre-final & final inspections)	3	M	6
	Warranty follow-up	4	M	4
	Plans & specs duplication & review, other pre-award and design rev.	4	M	4
	Review & research of regulations, policies & procedures/training	4	M	4
	SDB coaching	8	M	8
	Review/coordination of submittals	2	M	6
	Leave	5	M	20
	Putting out fires	12	M	27
Operations Assistant (2 pers. - GS 06)	Meetings (staff & with supervisor)	6	M	6
	Contract file maintenance (filing, payroll rev, new files, c/o binder)	20	M	40
	Information Systems (FIS, NAFI, ACASS/CCASS/FAIR)	10	M	10
	Receiving visitors/phone calls, mail runs/distribution	20	M	48
	Technical library management/updates	2	M	8
	Invoice Processing	14	M	14
	Close-outs (archiving, purging files, notify PM to recapture funds)	4	M	8
	Training/Travel (orders, claims, arrangements)	20	M	15

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
	Credit card purchases/review billing data	4	M	4
	Leave	5	M	20
ROICC - LCDR	Brief Preparation/participation	4	M	1.5
	Leave	2.5	M	8
	Staff/Management meeting	2	W	1.5
	Staffing/Admin	1	D	2
	Review/Reading/signing	1	D	1
	Contract Issues	2	W	1.5
	Project Site visits and inspections	2	W	1.5
	Reports/Status/WIP	2	W	1
	PT	3	W	1.5
	Troubleshooting	3	W	2
	Training	2	Y	40
AROICC - LTJG	Brief Preparation	3	M	1.5
	Leave	2.5	M	8
	Management meeting	1	W	1.5
	Modification scoping and estimating	4	M	2
	Negotiating Change Orders	2	W	1.5
	Production meetings	4	W	1.5
	Professional Development	5	W	1.25
	Project Site visits and inspections	1	D	1.5
	Project Team meetings	2	W	1
	PT	3	W	1
	RFI Reviews	4	M	1
	Submittal Reviews	4	M	1
	Team Brief presentation	2	M	1.5
	Training	2	Y	40
Engineer GS-12 (5 pers.)	Brief Preparation	1	W	1.5
	Leave	2.5	M	20
	Management meeting	3	W	6
	Modification scoping and estimating	4	M	8
	Negotiating Change Orders	2	M	8
	Production meetings	3	W	9
	Professional Development	2	M	3
	Project Site visits and inspections	4	W	5

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour
	Project Team meetings	3	W	9
	RFI Reviews	5	W	10
	Submittal Reviews	5	W	10
	Team Brief presentation	1	W	2
	Training	2	Y	40
Engineering Tech. GS-11	Leave	2.5	M	8
(4 pers.)	Safety Inspection	5	W	2
	Three Phases Meeting	2	W	1.5
	Dig Permit Meetings	1	M	2
	Outage Meetings	1	M	2
	Production meetings	3	W	9
	Professional Development	2	M	1.5
	Project Site visits and inspections	5	W	2
	Project Team meetings	3	W	9
	Submittal Reviews	5	W	2.5
	Team Brief presentation	2	W	1.5
	Training	2	Y	40
AROICC, ENS	Negotiating Change Orders	2	M	2
	Staff Meetings	1	W	1
	Team Meetings	2	W	1
	Team Update Briefs Prep	2	W	1.5
	Team Update Briefs Presentation	2	W	1.5
	Project Production Meetings	3	W	1.5
	Project Site Visits / Inspections	4	W	1
	Preconstruction Meetings	2	M	2
	Submittal Review	4	M	2
	Required Training	4	Y	40
	Professional Development	4	W	2
	Physical Training	5	W	1.5
	Leave	2	Y	120

3. Distance and Complexity

CONTRACT NUMBER	CONTRACTOR	CONTRACT TITLE	COMPLEXITY	Distance (Miles)*	Round trips	Period (D, W, M, Y)	Time (Travel) Round trip Hours
02-D-8005/2	NOVA GROUP, INC.	REPAIR FUEL STORAGE TANKS	3				
02-C-0020	MILLER THOMPSON	CONCORD PIER 2	3	30	1	D	1.5
02-C-0019	BURNS & MCDONNELL ENG CO	RAPCON	3				
02-C-0018	R. A. BURCH	ACOUSTICAL BAND CENTER	3				
02-F-0004	TETRA TECH	BACKFILL & PAVING OF PILOT-TEST SOILS, NCTS STOCKTON	1	54	2	W	2.5
01-C-6034	LEND LEASE ACTUS, LLC	118 UNIT FAMILY HOUSING	2				
01-D-6110/4	INNOVATIVE TECHNICAL SOLUTIONS, INC.	REMEDIAL ACTION TIDAL AREA LANDFILL IR SITE 01, NWS, CONCORD	1	30	2	W	1.5
01-D-6029/4	CAL-PAC ENGINEERING	REPAIR TAXIWAY “D”	2				
01-D-6029/3	CAL-PAC ENGINEERING	REPAIR TAXIWAY “N”	2				
01-D-6029/2	CAL-PAC ENGINEERING	REMOVE RUBBER & REPLACE STRIPING AT RUNWAY 03L-21R	2				
01-D-6029/1	CAL-PAC ENGINEERING	REMOVE RUBBER & REPLACE STRIPING AT RUNWAY 03R-21R	2				
00-C-3007	AZTECA	TRANSMITTER EQUIPMENT, DIXON	1	25	2	W	1
00-C-3002	KEY TURF	GOLF COURSE	1				
99-G-6095/2	VILLA ELECTRIC	RPR TO SUBSTATION “B”	2				
99-G-6093/18	LEON CONSTRUCTION	REPAIR ROOF, BLDG. 977	2				
99-G-6093/16	LEON CONSTRUCTION	REPAIR VOQ, BLDG. 418	2				
99-G-6093/8	LEON CONSTRUCTION	REPAIR VOQ, BLDG. 447	2				
99-G-6018/2	MYERS CONSTRUCTION	REPAIR BALL FIELDS	1				
99-G-6018/1	MYERS CONSTRUCTION	MISC. REPAIRS TO BLDG. 1, SACRAMENTO	1	40	1	W	2
99-G-6017/3	KOO CONSTRUCTION	RENOVATE BUILDING 248	2				
99-G-6017/2	KOO CONSTRUCTION	DEMO BLDGS. 136, 344, 370, 867 & 552	1				
99-G-3217/1	JMR CONSTRUCTION	ABATEMENT & DEMO OF BLDGS. 1204, 347 & 1022	1				
99-G-3207/1	WEST COAST CONTRACTORS	CAPEHART HOUSING, PHASE 2	2				
99-D-6652/4	ACTUS CORP	REPLACE FAMILY HOUSING (64) UNITS	3				

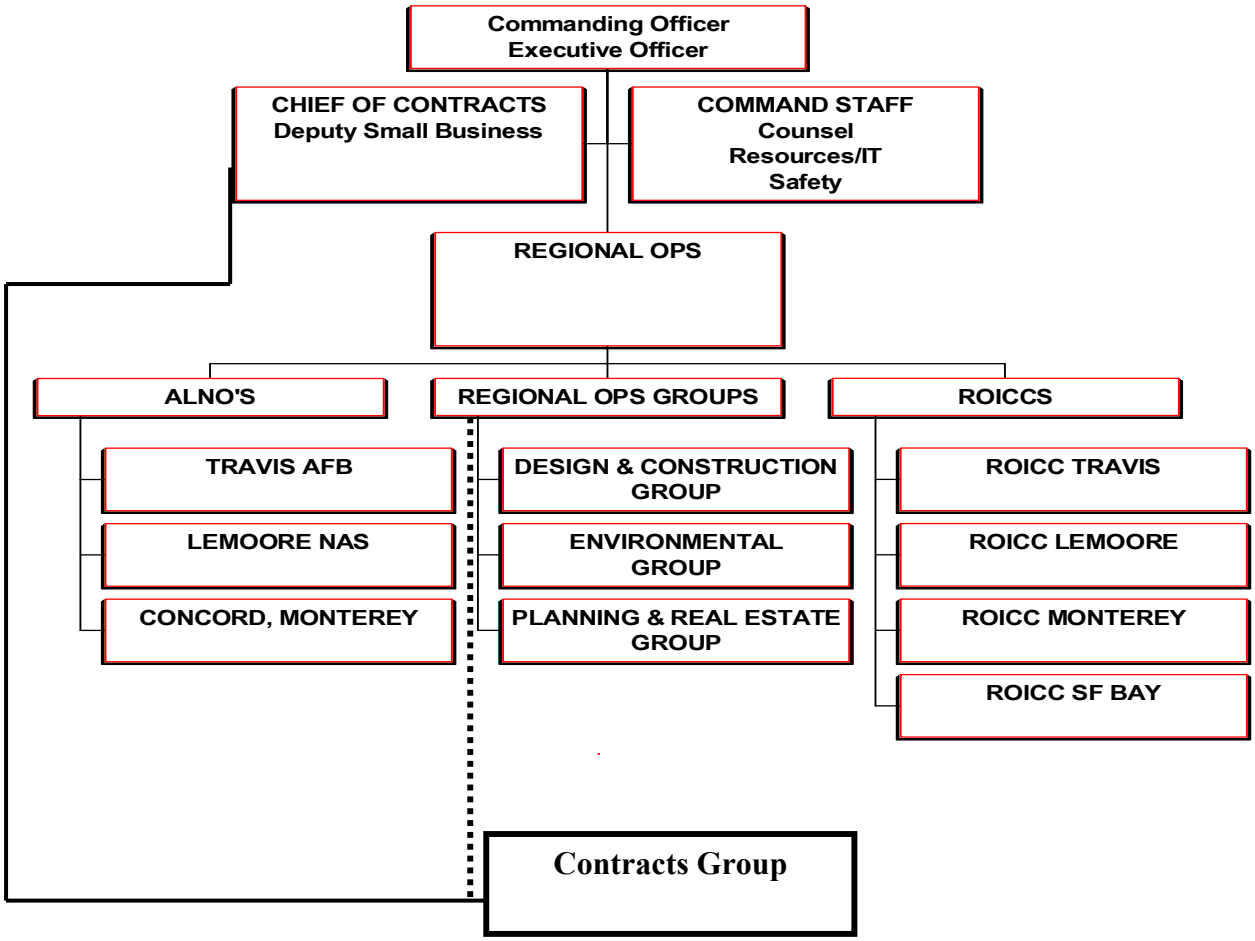
CONTRACT NUMBER	CONTRACTOR	CONTRACT TITLE	COMPLEXITY	Distance (Miles)*	Round trips	Period (D, W, M, Y)	Time (Travel) Round trip Hours
99-C-6098	ALLEN BENDER	WAR READINESS MATERIALS WAREHOUSE	3				
99-C-6001	HUNT BUILDING CORP	228 HOUSING UNITS	3				
99-C-6073	R.A. BURCH	AIR TRAFFIC CONTROL TOWER	4				
99-C-6083	J.I. GARCIA	RENOVATE BUILDING 551	2				
99-C-6053	R.A. BURCH	PHYSICAL FITNESS CENTER ADDITION	3				
98-D-2090/1	BENECO	52 UNITS, WHERRY HOUSING	3				
98-C-2047	RAMLOR	DEMO 82, 240, 805, 850, 961, 852	1				
98-D-2092/1	R.A. BURCH	RENOVATE BUILDING 239	2				
98-D-2091/2	SELCO INC	SIDEWALK/LANDSCAPE IMPROVEMENTS	1				
98-D-2076/77	IT CORPORATION	UST SITES BLDG. 916B/1316B NCTS STK	2	54	1	W	2.5
98-D-2035/3	VALENZUELA ENGINEERING	REPLACE PRIMARY SERVICE CABLES	2				
98-D-2035/1	VALENZUELA ENGINERING	REPAIR TEMPORARY LODGE BLDG 440	2				
98-C-2032	ACTECA CONSTRUCTION	REPAIR TAXIWAY	2				
97-C-1630	INTERTEX	ARMY ADMIN FACILITY	2				
97-D-1587/10	SELCO INC	RENOVATE FAMILY SUPPORT CTR BLDG 660	2				
97-D-1587/6	SELCO INC	BUILDING 21 REVITALIZATION	2				
97-C-1535	PARAGON CONSTRUCTION	RENOVATE EDU FAC BLDG 249	2				
96-D-6532/14	PARAGON CONSTRUCTION	REPAIR BLDG. 525	2				
96-D-6532/13	PARAGON CONSTRUCTION	BLDG. 1212, AIRCREW LIFT SUPPORT	2				
96-D-6532/11	PARAGON CONSTRUCTION	660 ROOF	2				
96-D-6532/10	PARAGON CONSTRUCTION	PHY FIT CENTER	2				
96-D-6532/9	PARAGON CONSTRUCTION	PMI	2				
96-D-6211/17	VALENZUELA ENGINEERING	DEMO P-7	1				
96-D-6211/15	VALENZUELA ENGINEERING	WHERRY HOUSING DRAFT STOPS	1				
96-D-6211/12	VALENZUELA ENGINEERING	PAPI LIGHTING	1				
96-D-6211/11	VALENZUELA ENGINEERING	RPR RIFLE RANGE	1				
96-D-6211/5	VALENZUELA ENGINEERING	SEISMIC DORMS	2				
96-D-6211/3	VALENZUELA ENGINEERING	RPR BASE OPS BLDG. P-4	2				
96-D-6085/15	CKY INC	UNDERGROUND STORAGE TANK REMOVAL, CONCORD	2	30	1	W	1.5

CONTRACT NUMBER	CONTRACTOR	CONTRACT TITLE	COMPLEXITY	Distance (Miles)*	Round trips	Period (D, W, M, Y)	Time (Travel) Round trip Hours
96-D-6085/9	CKY INC	SEDIMENT TRAPS FOR DRAINAGE, STOCKTON	2	54	1	W	2.5
96-C-6107	SOLTEK PACIFIC	FY97 O&M PROJECT P-4122, RPR BLDG. 243	3				

* - Unless otherwise noted, project is located on Travis AFB and is within 3 miles and a commute time of 5 minutes or less.

E. EFA WEST

1. Organizational Chart



2. EFA West HQ Ops

a. Mission Function Tasking Statement

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour	No of People	Total Hours	Status
HQ Administrative Personnel-GS5	Various general tasks supporting ROICC office administration	1	W	0.75	1	0.75	Full Time
HQ Contracting Office--GS13	Respond to questions/provide advice	1	W	0.75	1	0.75	Full Time
Design Project Leader--GS13	Respond to questions/provide advice	1	W	1.75	19	33.25	Full Time
Design Project Leader--GS13	Coordinate with AE	1	W	1	19	19	Full Time
Project Manager--GS13	Manage issues	1	W	1	4	4	Full Time
Project Manager--GS13	Manage Funding	1	W	0.75	4	3	Full Time
Counsel--GS14	Provide advice	1	W	2	1	2	Full Time
				8		62.75	
Pre-Construction Award Phase							
Design Project Leader	Manage AE Contract	1	W	17.25	19	327.75	Full Time
Design Project Leader	Review Contract Documents	1	W	10	19	190	Full Time
Design Project Leader	Meet with Customer	1	W	10	19	190	Full Time

3. West HQ cONTRACTS

a. Mission Function Tasking Statement

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour	Total Hours	Total Hours per year
Contract Specialist GS-13	Acquisition Planning	3	M	16	42 hr/mo	462 hrs/yr
Contract Specialist GS-13	Solicit Proposals	4	Y	23	92 hr/yr	92 hrs/yr
Contract Specialist GS-13	Manage Proposal Period (proposal inquiries, Preproposal Conferences, Receive proposals, issue Amendments, etc.)	4	Y	16	64 hr/yr	64 hrs/yr
Contract Specialist GS-13	Manage Evaluation Period (Kick-off Meeting, field TET questions Discussions, Review Evaluation Report, Brief SSA, Pricing Report)	4	Y	68	272 hr/yr	184 hrs/yr
Contract Specialist GS-13	Prepare Pre/Post Clearances For Source Selections	4	Y	32	128 hr/yr	128 hrs/yr
Contract Specialist GS-13	Award Contract (CHINFO, Award docs, Notices to Unsuccessful Offerors	4	Y	16	64 hr/yr	64 hrs/yr
Contract Specialist GS-13	Manage Post Award (Debriefs, Partnering, Design Kick-off Meetings, ROICC Trouble Shooting*)	4	Y	46	184 hr/yr	184 yrs/hr
Contract Specialist GS-13	Prepare and File all Contract Documents For Source Selections	4	Y	8	32 hr/yr	32 hrs/yr
Contract Specialist GS-13	Process Invoices	12	M	1	12 hr/mo	144 hrs/yr
Contract Specialist GS-13	Meetings	8	M	2	16 hr/mo	176 hrs/yr
Contract Specialist GS-13	Receive/Issue RFPs/Award, CTOs/Modification	9	M	16.5	148.5 hr/mo	148.5 hrs/yr

Position Description (Rank or GS level)	Task	# of times performed per period	Period D, W, M, Y	Hours or Fraction of Hour	Total Hours	Total Hours per year
	s to A/E Contracts					
Contract Specialist GS-13	Close Outs	15	Y	2	30 hr/yr	30 hrs/yr
Contract Specialist GS-13	Phone Calls/E-Mail	15	D	0.5	75 min/day	275 hrs/yr
Contract Specialist GS-13	Travel	4	M	2	8 hr/mo	88 hrs/yr
Contract Specialist GS-13	Training	40	Y	1	40 hr/yr	40 hrs/yr

Analysis above based on averaging
HQ 1102s, 8 total folks

*This does not include the substantial amount of hours involved in working a protest. Since there are maybe one or two at the most per year it did not seem appropriate to figure these hours into an average Contract Specialist. In the event there is a protest there would be an estimated 120 hours worth of effort.

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APPENDIX D. EFA WEST AND ROICC OFFICE MISSION, FUNCTION AND TASK STATEMENTS

A. ENGINEERING FIELD ACTIVITIES

a. BASIC FUNCTION: EFAs are echelon IV Commands reporting to the Engineering Field Division (EFD) Southwest.

b. DUTIES, RESPONSIBILITIES, ACCOUNTABILITY, AND AUTHORITY: EFA authority flows from, and is accountable to the EFD Commander. Major significant day-to-day activities that the EFA and the EFD perform are worked through communications between the Vice-Commander and the XOs of the EFAs. The EFA Northwest CO is ADDU to the Commander, Navy Region Northwest and to Commander, PACNAVFACENGCOM. The EFA West CO is ADDU to Commander PACNAFACENGCOM. The EFAs are accountable to the Commander Southwest.

B. ROICC OFFICES (ROICCS)

a. BASIC FUNCTION: ROICCs are multi-functional, forward deployed at the client locations, right-sized to execute continual, predictable, and routine client requirements. The ROICCs are also responsible for administration of AFT awarded design/build and construction projects and the award and administration of locally generated architect/engineer, construction, and FSC contracts. They are also responsible for the growth and development of their assigned staff members. The ROICC Office Advocate, who is accountable to the Operations Officer, coordinates ROICCs' support.

b. DUTIES, RESPONSIBILITIES, ACCOUNTABILITY, AND AUTHORITY: ROICCs, are responsible for the execution of all projects assigned to their office, maintaining client and project team relationships during the ROICC administration phase, and for the complete satisfaction of the client they serve. The ROICCs are responsible for administration of contracts, awarded by the AFTs, and advertisement, award, and

administration of locally generated architect/engineer, construction, and facilities service contracts. Physically located closest to the client, they must provide the project teams feedback and knowledge gained from previous projects. PLs maintain contact with the ROICC during the ROICC administration phase of projects and bring back lessons learned to improve future projects and processes. ROICCs provide workload assessments, execution reports, action plan status, and metric status to the Operations Officers. They serve as members of specific project teams formed by the PLs and are involved in all phases from project conception. They are the construction managers during the construction period, coordinating with the PL, who still monitors the project to provide the ROICC any required support. The ultimate goal is to eliminate any perceptions or feeling of handoff between the AFT and ROICC. The goal is reached when the ROICC and AFT feel that they are part of one team. ROICC Office leaders are responsible for consistency of personnel awards across all teams, balancing resources, assembling acquisition strategy information and providing it to the respective BLM/BLCs, monitoring team metrics, consistent use of FOCAS, SPOTS and FIS, and team morale. At Southwest, ROICCs are accountable to the BOO. At EFA West and EFA Northwest, ROICCs are accountable to the Operations Officer.

APPENDIX E. TOTAL WORK-HOURS

Civilian Hours

	FY98		FY99		FY00		FY01		FY02	
FIELD OFFICE	**S/T**	**O/T**	**S/T**	**O/T**	**S/T**	**O/T**	**S/T**	**O/T**	**S/T**	**O/T**
LEMOORE	23,965.0	358.2	31,235.5	1,005.5	33,986.0	704.0	36,014.5	1,015.6	37,786.8	1,327.2
MONTEREY	19,217.8	116.5	16,702.0	8.0	18,630.0	0.0	14,778.0	25.5	14,616.0	55.0
SAN FRANCISCO	29,987.5	431.5	27,575.9	228.5	25,221.6	44.5	24,968.5	139.0	27,528.0	358.0
TRAVIS	34,384.0	1,006.5	29,129.5	375.5	29,588.5	201.5	31,049.0	245.5	30,511.5	731.7
TOTAL	**107,554.3**	**1,912.7**	**104,642.9**	**1,617.5**	**107,426.1**	**950.0**	**106,810.0**	**1,425.6**	**110,442.3**	**2,471.9**

Military Hours	**ST**	**OT**	**# mil**
LEMOORE	8120	1015	4
MONTEREY	4060	508	2
SAN FRANCISCO	2030	254	1
TRAVIS	6090	761	3

2030 ST work hours in a year

We don't keep track of military hours. Info to left assumes 1 hr OT per day for military. Apply for each year.

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APPENDIX F. EFA WEST EMPLOYEES BY PAY GRADE

Loc	ORG CODE	Series	Grades	TITLE
H	W00		O6	CO
H	W00M	GS-0344	07	MANAGEMENT ASSISTANT (OA)
H	W00M	GS-0344	07	MANAGEMENT ASSISTANT (OA)
H	W00M	GS-0344	07	MANAGEMENT ASSISTANT (OA)
H	W01	GM-0505	14	FINANCIAL MANAGER
H	W01	GS-2210	13	IT SPEC (PLYPLN)
H	W01	GS-0501	13	LEAD FINANCIAL ANALYST
H	W01	GS-0343	13	LEAD PROGRAM ANALYST
H	W01	GS-2210	12	IT SPEC (INFOSEC/PLYPLN)
H	W01	GS-0343	12	PROGRAM ANALYST
H	W01	GS-0343	11	PROGRAM ANALYST
H	W01	GS-0343	11	PROGRAM ANALYST
H	W01	GS-0343	11	PROGRAM ANALYST
H	W01mil		E7	Admin support
H	W01mil		E7	Admin support
H	W02	GS-1102	15	SUPV CONTRACT SPEC
H	W021	GS-1102	13	LEAD PROCUREMENT ANALYST
H	W0211	GS-1102	13	CONTRACT SPEC
H	W0211	GS-1102	13	CONTRACT SPEC
H	W0211	GS-1102	13	CONTRACT SPEC
H	W0211	GS-1102	12	CONTRACT SPEC
H	W0212	GS-1102	14	SUPV CONTRACT SPEC
H	W0212	GS-1102	13	CONTRACT SPEC
H	W0212		11	CONTRACT SPEC
H	W05	GM-0801	15	SUPV GENERAL ENGINEER
H	W05	GS-0028	14	SUPV ENVIRONMENTAL PROTECTION SPEC
H	W05	GS-0808	13	ALNO
H	W05	GS-0819	13	ALNO
H	W05	GS-0819	13	ALNO
H	W051	GM-0801	14	SUPV GENERAL ENGINEER
H	W051	GS-0804	13	FIRE PROTECTION ENGINEER
H	W051	GS-0801	13	GENERAL ENGINEER
H	W051	GS-0801	12	GENERAL ENGINEER
H	W051		11	CIVIL ENGINEERING TECHNICIAN
H	W0511	GS-0808	13	ARCHITECT
H	W0511	GS-0810	13	CIVIL ENGINEER
H	W0511	GS-0810	12	CIVIL ENGINEER
H	W0511	GS-0810	12	STRUCTURAL ENGINEER
H	W0512	GS-0810	13	CIVIL ENGINEER
H	W0512	GS-0810	13	CIVIL ENGINEER
H	W0512	GS-0830	13	MECHANICAL ENGINEER

Gray highlight means a significant portion of their time is dedicated to conractually specific issues.

Loc	ORG CODE	Series	Grades	TITLE
H	W0512	GS-0850	12	ELECTRICAL ENGINEER
H	W0512	GS-0801	12	GENERAL ENGINEER
H	W0513	GS-0808	13	ARCHITECT
H	W0513	GS-0808	13	ARCHITECT
H	W0513	GS-0808	13	ARCHITECT
H	W0513	GS-0810	13	CIVIL ENGINEER
H	W0513	GS-0808	12	ARCHITECT
H	W0513	GS-0808	12	ARCHITECT
H	W0513		12	GEOTECHNICAL ENGINEER
H	W052	GM-0819	14	SUPV ENVIRONMENTAL ENGINEER
H	W052	GS-0819	13	ENVIRONMENTAL ENGINEER
H	W052	GS-0819	13	ENVIRONMENTAL ENGINEER
H	W052	GS-0819	13	ENVIRONMENTAL ENGINEER
H	W052	GS-0819	13	ENVIRONMENTAL ENGINEER
H	W052	GS-0819	12	ENVIRONMENTAL ENGINEER
H	W052	GS-0819	12	ENVIRONMENTAL ENGINEER
H	W052	GS-0819	12	ENVIRONMENTAL ENGINEER
H	W053	GS-0028	14	SUPV ENVIRONMENTAL PROTECTION SPEC
H	W053	GS-0020	13	COMMUNITY PLANNER
H	W053	GS-1170	11	REALTY SPEC
H	W0531	GS-0020	13	COMMUNITY PLANNER
H	W0531	GS-0028	13	ENVIRONMENTAL PROTECTION SPEC
H	W0531	GS-0028	13	ENVIRONMENTAL PROTECTION SPEC
H	W0531	GS-0020	13	SENIOR COMMUNITY PLANNER
H	W0532	GS-1373	13	LAND SURVEYOR
H	W0532	GS-0401	13	NATURAL RESOURCES SPEC
H	W0532	GS-1170	13	REALTY SPEC
L	W054LM		O4	ROICC
L	W054LM		O3	AROICC
L	W054LM		O3	AROICC
L	W054LM		O1	AROICC
L	W054LM	GS-0810	13	SUPV CIVIL ENGINEER
L	W054LM	GS-1102	13	SUPV CONTRACT SPEC
	W054LM	GS-0810	12	CIVIL ENGINEER
L	W054LM		12	CIVIL ENGINEER
L	W054LM	GS-1102	12	CONTRACT SPEC
L	W054LM	GS-1102	12	CONTRACT SPEC
L	W054LM	GS-1102	12	CONTRACT SPEC
L	W054LM		12	CONTRACT SPEC
L	W054LM	GS-0850	12	ELECTRICAL ENGINEER
L	W054LM		11	CONTRACT SPEC
L	W054LM	GS-0802	11	ENGINEERING TECHNICIAN
L	W054LM	GS-0802	11	ENGINEERING TECHNICIAN
L	W054LM	GS-0802	11	ENGINEERING TECHNICIAN
L	W054LM	GS-0802	11	ENGINEERING TECHNICIAN
L	W054LM	GS-0802	11	ENGINEERING TECHNICIAN

Loc	ORG CODE	Series	Grades	TITLE
L	W054LM	GS-0802	11	ENGINEERING TECHNICIAN
L	W054LM	GS-0303	06	OPERATIONS ASSISTANT (OA)
L	W054LM	GS-0303	06	OPERATIONS ASSISTANT (OA)
L	W054LM	GS-0303	06	OPERATIONS ASSISTANT (OA)
M	W054MY		O3	ROICC
M	W054MY		O2	AROICC
M	W054MY	GS-1102	13	ROICC SUPV CONTRACT SPEC
M	W054MY	GS-1102	12	CONTRACT SPEC
M	W054MY	GS-0810	12	SUPV CIVIL ENGINEER
M	W054MY	GS-1102	11	CONTRACT SPEC
M	W054MY	GS-1102		CONTRACT SPEC
M	W054MY	GS-0802	11	ENGINEERING TECH QA REP
M		GS-0802	11	ENGINEERING TECHNICIAN
S	W054SF		O3	ROICC
S	W054SF	GM-0810	13	SUPV CIVIL ENGINEER
S	W054SF	GS-1102	13	SUPV CONTRACT SPEC
	W054SF	GS-1102	12	CONTRACT SPEC
S	W054SF	GS-1102	12	
S	W054SF	GS-0819		ENVIRONMENTAL ENGINEER
S	W054SF	GS-0819	12	ENVIRONMENTAL ENGINEER
S	W054SF	GS-0819	12	ENVIRONMENTAL ENGINEER
S	W054SF	GS-0819	12	ENVIRONMENTAL ENGINEER
S	W054SF	GS-0802	11	ENGINEERING TECHNICIAN
S	W054SF	GS-0802	11	ENGINEERING TECHNICIAN
S	W054SF	GS-0802	11	ENGINEERING TECHNICIAN
S	W054SF	GS-0303	06	OPERATIONS ASSISTANT (OA)
T	W054TR		O4	ROICC
T	W054TR		O3	AROICC
T			O2	AROICC
T	W054TR	GS-1102	13	ROICC SUPV CONTRACT SPEC
T	W054TR	GS-0810	13	SUPV CIVIL ENGINEER
T	W054TR	GS-0810	12	CIVIL ENGINEER
	W054TR	GS-0810	12	CIVIL ENGINEER
T	W054TR	GS-0810	12	
T	W054TR	GS-0810		CIVIL ENGINEER
T	W054TR		12	CONTRACT SPEC
T		GS-1102	12	CONTRACT SPEC
T	W054TR	GS-1102	11	CONTRACT SPEC
T	W054TR	GS-0802	11	ENGINEERING TECHNICIAN
T	W054TR	GS-0802	11	ENGINEERING TECHNICIAN
	W054TR	GS-0802	11	ENGINEERING TECHNICIAN
T	W054TR	GS-0802	11	
T	W054TR	GS-0303		OPERATIONS ASSISTANT (OA)
T	W054TR	GS-0303	06	OPERATIONS ASSISTANT (OA)
H	W05A		O4	REGIONAL OPS OFFICER
H	W09C		O5	XO

Loc	ORG CODE	Series	Grades	TITLE
H	W09C	GS-0905	15	ATTORNEY-ADVISOR
H	W09C	GM-0905	15	ATTORNEY-ADVISOR
H	W09C	GS-0905		ATTORNEY-ADVISOR (GENERAL)
H	W09C	GM-0905	14	

APPENDIX G. EFA WEST CONTRACTS

				G & Y Algorithm Work Hours					Civilians on Board					FIP ($M)					WIP ($M) (Included Type I, II)				
EFA West	ACF	AF	PPV	98	99	00	01	02	98	99	00	01	02	98	99	00	01	02	98	99	00	01	02
Lemoore	1.25	1.08	0.00	52603	56511	38963	42396	42396	16	18	17	14	15	1.9	4.4	2.4	3.1	3.1	72.0	74.9	52.3	56.4	56.4
Travis	1.24	1.08	0.00	27449	45369	35769	30507	30507	15	15	15	14	15	0.0	0.0	0.0	0.0	0.0	38.6	63.8	50.3	42.9	42.9
Monterey	1.17	1.06	0.00	12423	16889	19151	13724	13724	8	8	9	9	9	1.8	9.1	6.0	5.2	5.2	15.6	14.3	20.7	13.9	13.9
Alameda (SF)	1.20		0.00	15582	26951	38198	33283	33283	14	14	12	8	11	0.3	0.0	0.4	0.1	0.1	21.6	37.9	53.3	46.7	46.7
HQ									93	97	93	79	88										
Total				108056	145720	132081	119910	119910	146	152	146	124	138	4	14	9	8	8	148	191	177	160	160

	# of Construction Contracts					# of FSC Contracts					Hours of Tasking per year					Total Civilian Hours S/T & O/T				
EFA West	98	99	00	01	02	98	99	00	01	02	98	99	00	01	02	98	99	00	01	02
Lemoore	110	141	179	233	274	96	76	25	1	0					39104	24323	32241	34690	37030	39114
Travis	24	32	44	40	17	0	0	0	0	0					31548	35391	29505	29790	31295	31243
Monterey	171	202	177	172	169	14	0	0	0	0					14562	19334	16710	18630	14804	14671
Alameda	47	77	79	94	94	17	6	3	1	1					27369	30419	27804	25266	25108	27886
HQ																				
Total	352	452	479	539	554	127	82	28	2	1	0	0	0	0	112583	109467	106260	108376	108236	112914

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APPENDIX H. LESSONS LEARNED FROM NAS LEMMORE STIKEFIGHTER WEAPONS SCHOOL

- Goal is the optimum use of resources to include dollars, facilities, and billet/position quality

- Interactive process

- Planning
    - Determine areas of concern
    - Establish manpower baseline
    - Send draft tasking statements to activity for review

- Data Gathering/Analysis
    - Authenticate mission, functions and tasks
    - Evaluate organizational structure
    - Refine tasking statement
    - Conduct work measurement
    - Develop statement of manpower requirements (SMR)
    - Assemble study audit trail

- Report Writing
    - Executive summary
    - Tasking statement (condensed)
    - Workload indicators
    - Applicable narrative discussion
    - Manpower requirements

- Data gathering and analysis process
    - Send out mission function tasking survey to command
        - Survey request consists of list of tasks performed by person, duration and frequency
    - Verify survey through interviews and probing questions
    - Observe work processes

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